openGear

# MC1-MK

## Master Control Switcher
## Installation Manual

ROSS
Video Production Technology

# MC1-MK Installation Manual

- Ross Part Number: MC1MKDR-004A-04
- Release Date: October 23, 2012.

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# Important Regulatory and Safety Notices to Service Personnel

Before using this product and nay associated equipment, refer to the "**Important Safety Instructions**" listed below to avoid personnel injury and to prevent product damage.

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## Symbol Meanings

*This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage to persons or equipment.*

**Warning** — *The symbol with the word "**Warning**" within the equipment manual indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.*

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**ESD Susceptibility** — *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.*

## Important Safety Instructions

**Caution** — *This product is intended to be a component product of the DFR-8300 series frame. Refer to the DFR-8300 Series Frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.*

**Warning** — *Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cords from the chassis' rear appliance connectors before servicing this area.*

**Warning** — *Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.*
*This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained with the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair. To reduce the risk of fire, replacement fuses must be the same time and rating. Only use attachments/accessories specified by the manufacturer.*

**Warning** — *This product includes an "Ethernet Port" which allows this product to be connected to a local area network (LAN). Only connect to networks that remain inside the building. Do not connect to networks that go outside the building.*

# EMC Notices

## United States of America
## FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

**Notice** — *Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.*

## CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe "A" est conforme a la norme NMB-003 du Canada.

## EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of CE Directive 93/68/EEC.

## INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, and found to comply with the limits for a Class A Digital device.

**Notice** — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

# Maintenance/User Serviceable Parts

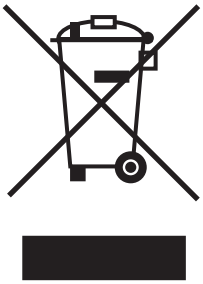
Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. See the "Warranty and Repair Policy" section in this manual for details.

# Environmental Information

**The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.**

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed out wheelie bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performance of our products.

## Company Address

**Ross Video Limited**
8 John Street
Iroquois, Ontario, K0E 1K0
Canada

**Ross Video Incorporated**
P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office: (+1) 613 • 652 • 4886
Fax: (+1) 613 • 652 • 4425
Technical Support: (+1) 613 • 652 • 4886
After Hours Emergency: (+1) 613 • 349 • 0006
E-mail (Technical Support): techsupport@rossvideo.com
E-mail (General Information): solutions@rossvideo.com
Website: http://www.rossvideo.com

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# Introduction

## In This Chapter

This chapter contains the following sections:

- Product Summary
- Functional Overview
- System Integration
- Interfaces
- Documentation Terms and Conventions

### A Word of Thanks

Congratulations on your purchase of the Ross Video MC1-MK Master Control Switcher. The MC1-MK is part of a full line of Ross Video digital products which are backed by over 25 years of engineering and design expertise. You will be pleased at how easily your new card fits into your overall working environment. Equally pleasing is the product quality, reliability, and functionality.

Should you have a question pertaining to the installation or operation of your MC1-MK, please contact us at the numbers listed in the section "**Contact Us**" located at the back of this manual. Our technical support staff is always available for consultation, training, or service.

# Product Summary

The MC1-MK includes the following features:

- Compliance with SDI SMPTE 292M (1.485Gbps) and SMPTE 259M (270Mbps)
- Four[1] separate stills/animations in use at any time (Logos 1 to 4); each logo may also have an optional Alpha channel (Alpha 1 to 4)
- 2GB of DDR playout memory with support for TGA, PNG and JPG formats
- Support of popular formats such as 1080i, and 720p
- Eight bi-directional ports that are user programmable to be a GPI or a Tally
- Four SDI inputs that include two background inputs (A, B), External Key Video, and External Key Alpha
- Four SDI outputs that may be configured as PGM, Preview, or Clean Feeds
- Bypass relay from BKGD A (BNC 3) to Output 1 (BNC 5) protects your on-air feed when the device is taken off-line and ensures critical program content is not lost
- Ethernet 10/100Mbit connectivity for easy upgrades in the field and for transferring files
- Reports status and configuration remotely via the DashBoard Control System™
- Provides remote serial control of the card using the Miranda™ Presmaster protocols
- Specify a card analog reference
- Supports SNMP alarms for the input and reference signals
- Specify how the input signal timing is reported (relative to the reference or the output)
- Provides an overlay engine capable of displaying one layer of text in real time
- V-Fade, Take-Fade, Fade-Take or Mix between video sources
- Clean audio switching for embedded audio at 48kHz
- Fade to Black function
- Provides keyer controls such as clip and gain, key invert, and transparency
- Fully compliant with openGear specifications and installs in the DFR-8321 series frames
- 5 year transferable warranty

1. Or three if EAS is used; in this case one channel is reserved for EAS.

# Functional Overview

This section provides a functional block diagram for the MC1-MK card only.

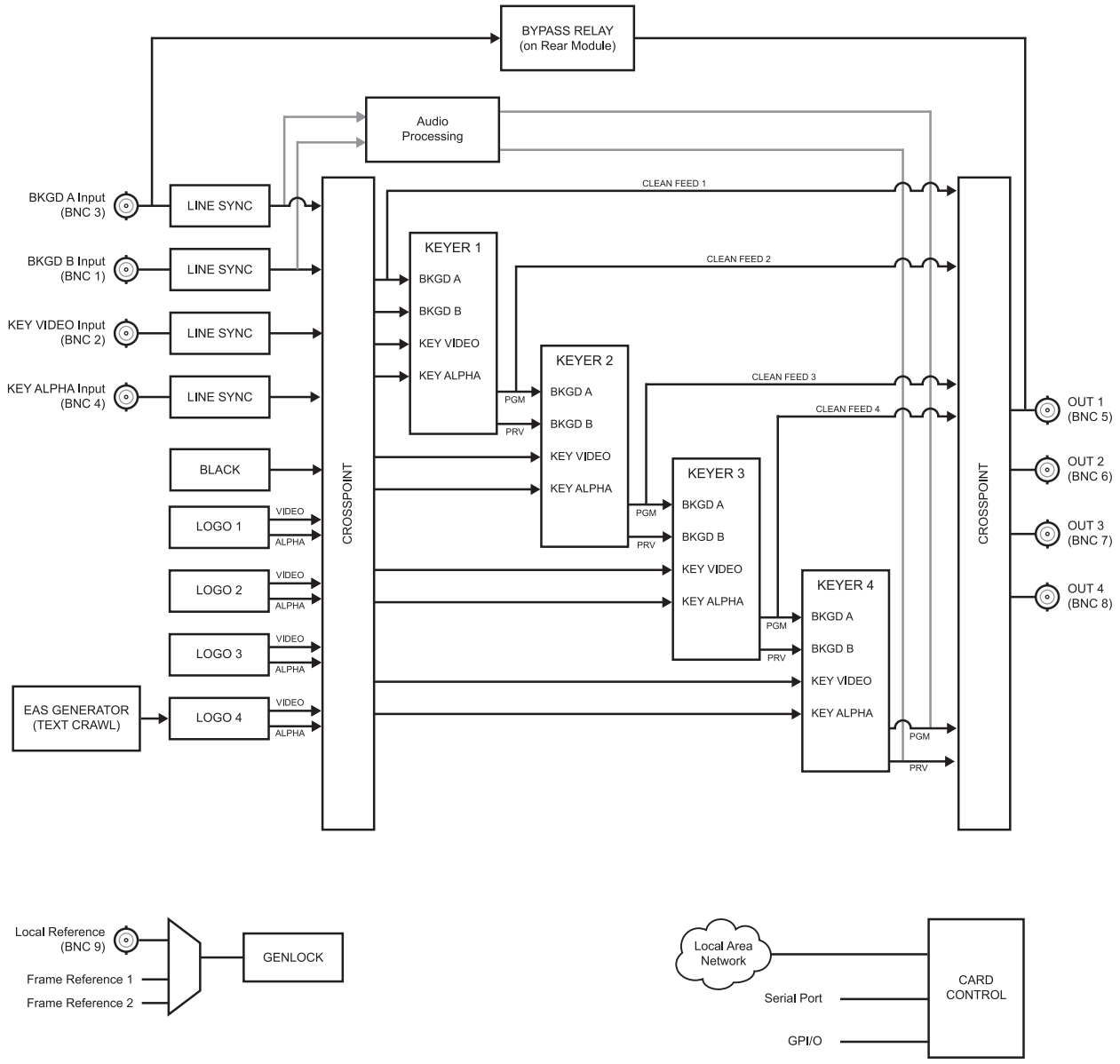



***Figure 1.1*** *Simplified Block Diagram — MC1-MK Card*

# System Integration

This section provides a system diagram that illustrates one way to integrate your MC1-MK into a Master Control System. Please note that this is only an example and your facility needs may differ from what is presented here.

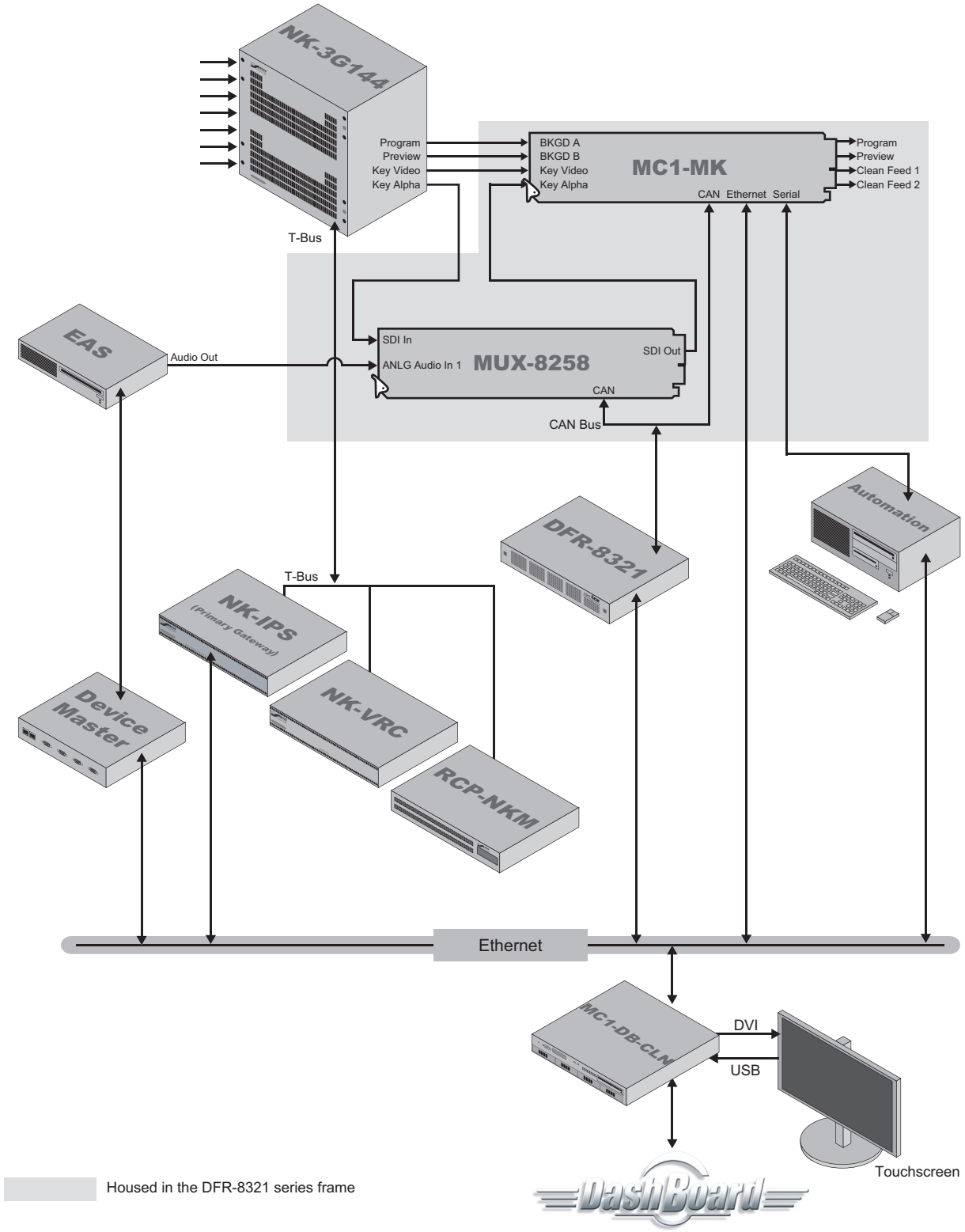



***Figure 1.2** System Integration — MC1-MK*

# Interfaces

The MC1-MK is intended to be controlled primarily via an automation system such as the Miranda™ Presmaster. Secondary control is available via the DashBoard Control System™ client software, as well as through GPI signals. Optional SNMP monitoring is also available.

## DashBoard Control System™

The DashBoard client software enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with cards in the openGear DFR-8300 series frames through a MFC-8300 Series Network Controller Card. This controller card is required in order to use DashBoard to control and monitor openGear cards.

The MC1-MK includes two DashBoard interfaces: Configuration and On Air Controls. Both interfaces are accessed by expanding the MC1-MK node in the DashBoard Tree View and selecting the appropriate sub-node. The Configuration interface is intended for setup purposes such as specifying sources, setting up serial and ethernet communications, and bus mapping. The On Air Controls interface includes operational controls such as configuring keyer sources, loading media files to logo channels, and performing transitions.

### *For More Information on...*

- configuring the MFC-8300 Series Network Controller card, refer to the ***MFC-8300 Series User Manual***.
- installing and using DashBoard, refer to the ***DashBoard User Manual***.

## SNMP Monitoring

The MFC-8300 Series Network Controller card in the DFR-8321 provides optional support for remote monitoring of your frame using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring tools.

### *For More Information on...*

- the available SNMP monitoring features, refer to the Management Information Base (MIB) file that came with your openGear card(s).
- SNMP Monitoring, refer to the ***MFC-8300 Series User Manual***.

## Serial Protocols

The MC1-MK serial interface provides a communication link between a computer based editing or automation system and the MC1-MK.

### *For More Information on...*

- setting up an automation system with the MC1-MK, refer to the MC1-MK setup sheet for your device. This setup sheet is available on the ***MC1-MK Documentation Resources CD*** that accompanied your MC1-MK.
- the Miranda™ Presmaster protocol, refer to the ***Miranda Presmaster Automation Protocol Manual***.

# Documentation Terms and Conventions

This section briefly summarizes the terms and conventions used throughout this manual.

## Terms

The following terms are used:

- "**Auto Select Key**" is a key in which two video signals are required to insert the key. The Key Alpha is used to cut the hole in the video and Key Video is used to fill the hole.
- "**Board**" or "**Card**" refers to both the MC1-MK including all components and switches unless otherwise noted.
- "**DashBoard**" refers to the DashBoard Control System™ client software.
- "**DFR-8321 series frames**" refers to all versions of the 20-slot (DFR-8321) frames and any available options.
- "**LTC**" and "**Timecode**" both refer to Linear Timecode unless otherwise noted.
- "**MUX-8258-C**" refers to the MUX-8258-4C and MUX-8258-8C unless otherwise noted.
- "**Operator**" and "**User**" refers to the person who uses the MC1-MK.
- "**Self Key**" is a key in which the luminance, or brightness, values of the key source is used as the alpha for the key.
- "**System**" and "**Video System**" refers to the mix of interconnected digital and analog production equipment in which the MC1-MK operates.

## Conventions

The following conventions are used:

- The "**Operating Tips**" and "**Note**" boxes are used throughout this manual to provide additional user information.

# Physical Installation

## In This Chapter

This chapter provides an overview for the basic physical installation of your MC1-MK.

The following topics are discussed:

- Before You Begin
- Card Overview
- Getting Started
- Video Connections
- Ethernet Communications
- GPIO/Tally Setup
- Linear Timecode Setup

# Before You Begin

Before you begin, ensure that you are using DashBoard version 5.0.0 or higher.The DashBoard Control System software and user manual are available to download from the Ross Video website.

## Static Discharge

Throughout this chapter, please heed the following cautionary note:

**ESD Susceptibility** — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

## Unpacking

Unpack each card you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

## Related Publications

It is recommended to consult the following Ross documentation before installing and configuring your MC1-MK:

- ***DashBoard User Manual***, Ross Part Number: 8351DR-004
- ***DFR-8300 Series Frames User Manual***, Ross Part Number 8300DR-005
- ***MC1-MK Operation Manual,*** Ross Part Number: MC1MKDR-004B
- ***MC1-SRV-DBQuick Start Guide,*** Ross Part Number: MC1MKDR-002
- ***MFC-8300 Series User Manual***, Ross Part Number: 8300DR-004
- ***MUX-8258 (-A, -4C, -8C) User Manual***, Ross Part Number: 8258DR-004

# Card Overview

This section provides an overview of the MC1-MK card components.

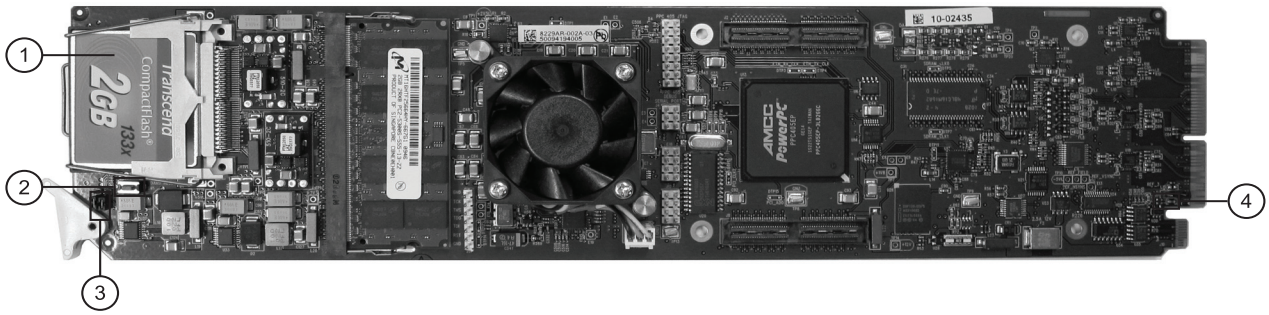



***Figure 2.1** Components*

| | |
|---|---|
| 1) CompactFlash® Card | 3) JP5, JP6 |
| 2) Board Reset Button (SW1) | 4) Reference Termination (JP7) |

### 1. CompactFlash® Card

The CompactFlash card provides 2GB of flash memory for storage of media files, such as stills and animations, for the MC1-MK.

### 2. Board Reset Button (SW1)

Pressing this button resets the microprocessor and re-initializes the card. This is a hard reset of the card. This should only be performed as advised by Ross Video Technical Support.

### 3. JP5, JP6

These jumpers are not yet implemented and must be left in the default position of Pin 2 (center) and Pin 3 (bottom).

### 4. Reference Termination (JP7)

**J7** is a 3-position jumper block used to configure the 75ohm termination on the local analog reference input on **BNC 9** of the Rear Module.

- **Pin 1** (left) + **Pin 2** (center) position — In this position, the analog reference is terminated with an 75ohm resistor. This configuration is to be used for point-to-point cabling, or on the last card of a daisy chain topology. This is the default position (**Figure 2.2**).

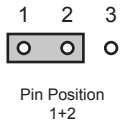



***Figure 2.2** J7 — Default Position*

- **Pin 2** (center) + **Pin 3** (right) position — In this position, the 75ohm terminator is removed and the analog reference is not terminated. This configuration is used in a daisy chain cabling topology where only the last card is to be terminated.

## Card-edge LEDs

This section describes the card-edge LEDs that are used to monitor communication. (**Figure 2.3**)

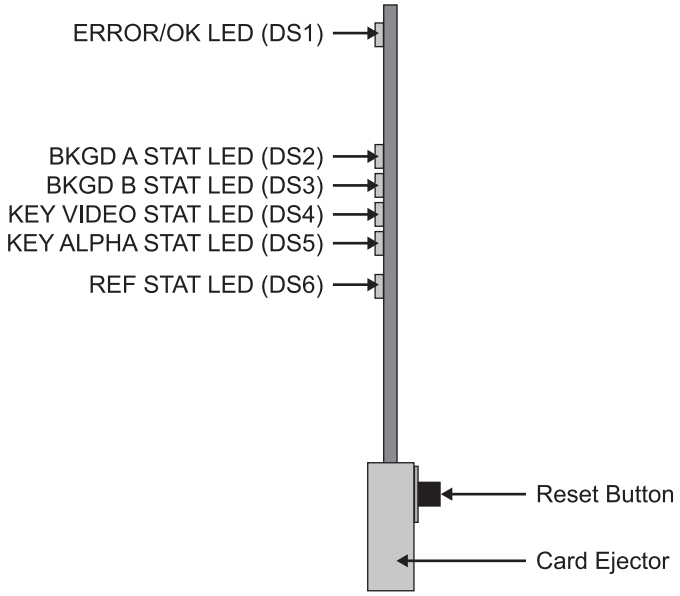



***Figure 2.3** Card-edge Controls*

***Table 2.1 LEDs on the Card-edge***

| LED | Color | Display and Description |
|---|---|---|
| **ERROR/OK** | Green | When this LED is green, the card is in normal operation with no errors. |
| | Red | When this LED is red, the card is experiencing internal errors. |
| | Off | When this LED is off, there is no power to the card. |
| **BKGD A STAT** | Green | When this LED is green, the BKGD A video input is valid. |
| | Red | When this LED is red, the BKGD A input is not present or is invalid. |
| **BKGD B STAT** | Green | When this LED is green, the BKGD B video input is valid. |
| | Red | When this LED is red, the BKGD B input is not present or is invalid. |
| **KEY VIDEO STAT** | Green | When this LED is green, the external Key Video input is valid. |
| | Red | When this LED is red, the external Key Video input is not present or is invalid. |
| **KEY ALPHA STAT** | Green | When this LED is green, the external Key Alpha video input is valid. |
| | Red | When this LED is red, the external Key Alpha video input is not present or is invalid. |
| **REF STAT** | Green | When this LED is green, the reference signal is valid. |
| | Red | When this LED is red, the reference signal is not present or is invalid. |

# Getting Started

The MC1-MK includes a system of openGear cards installed in an openGear DFR-8321 series frame that communicate via DashBoard to external devices such as routers and Emergency Alert Systems (EAS). This section provides information for setting up the frame, cards, and DashBoard before you can proceed to cabling and communicating with external devices.

## Installing the openGear Frame

The openGear DFR-8321 series frame is a 2RU high density modular frame, designed to accommodate up to 20 openGear cards. The MFC-8300 Series Network Controller card, the MC1-MK, and the MUX-8258 are installed in the frame slots.

When you are facing the openGear DFR-8321 series frame front, the MFC-8300 is located in the furthest slot to the right (next to the power supplies). This card features an ethernet interface which allows the openGear cards to be monitored and controlled using DashBoard.

### *For More Information on...*

- physically installing your frame, refer to the ***DFR-8300 Series User Manual***.
- configuring an openGear card, refer to the associated product user manual.

## Installing the MC1-MK Card

This section provides a brief overview of the required Rear Modules and physical installation of the MC1-MK. When installing the card in the DFR-8321 series frame, the **8320AR-033** Rear Module is used. This rear module occupies four slots in the frame.

### Power Fail Relay

There is a power fail relay from the BKGD A input to Output 1 on the Rear Module. The purpose of this relay is as follows:

- When the card is removed from the frame, the relay passes video from the BKGD A input to the Output 1 of the card. This allows the card to be serviced without interrupting the video signal.
- If the card loses power, or the frame loses power, the video still passes through.
- When the card boots, the relay will be left in Bypass mode until the card can generate a valid output. Once the card is up and functional, the relay is disabled.

### To install a rear module in an openGear DFR-8321 series frame

1. Remove the Blank Plates from the rear of the selected card frame slots.
2. Seat the bottom of the Rear Module in the seating slot at the base of the backplane of the frame.
3. Align the top hole of the Rear Module with the screw hole on the top-edge of the frame backplane.
4. Using a Phillips screwdriver and the supplied screw, fasten the Rear Module to the backplane. Do not over tighten.
5. The Rear Module Label is self-adhesive. Remove the wax sheet before affixing the label.
6. Affix the supplied Rear Module Label to the BNC area of the Rear Module.

7. To ensure proper frame cooling and ventilation, verify that all unused slots are covered with Rear Modules or Blank Plates.

**Note** — *Verify that the card aligns with the Rear Module before fully tightening any of the slot screws.*

### To install a card in the openGear DFR-8321 series frame

1. Ensure that the DFR-8321 series frame is properly installed.
2. Ensure the Rear Module is properly installed.
3. Hold the card by the edges and carefully align the card edges with the rails in the frame.
4. Fully insert the card into the frame until the card is properly seated in the Rear Module.

## Installing the Rack Mount PC

Install and configure your rack mount PC as outlined in the ***MC1-SRV-DB Quick Start Guide*** that came with your system.

## Installing the Touchscreen Display

The interactive touchscreen display provides all of the menu interaction for the MC1-MK, including functions such as configuration, crosspoint selection, and performing transitions. Ensure that the touchscreen is connected to the PC via a USB cable. Refer to the documentation that came with your touchscreen for specific installation and setup instructions.

## Using DashBoard to Access the MC1-MK

Before proceeding, ensure that the DashBoard client software is installed on a PC connected to your facility network. The DashBoard software and user manual are available from the Ross Video website.

### To launch DashBoard

1. Ensure that you are running DashBoard software version 5.0 or higher.
2. Launch DashBoard by double-clicking its icon on your desktop.
3. Ensure that the DFR-8321 series frame with the MC1-MK is displayed in the Basic Tree View. If not, consult the ***MFC-8300 Series User Manual*** and ***DashBoard User Manual***.

### To access the MC1-MK Configuration Interface

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.

# Video Connections

Connect your input video signals to the BNCs on the rear module as required. In the following figures, the rear module depicted on the left is for the MC1-MK while the rear module on the right is for the MUX-8258-C. Note that the slots your rear modules are located in the frame may differ than what is presented here.

## Input Cabling

Connect your MC1-MK input video signals as illustrated in **Figure 2.4**. Ross Video does not supply these cables.

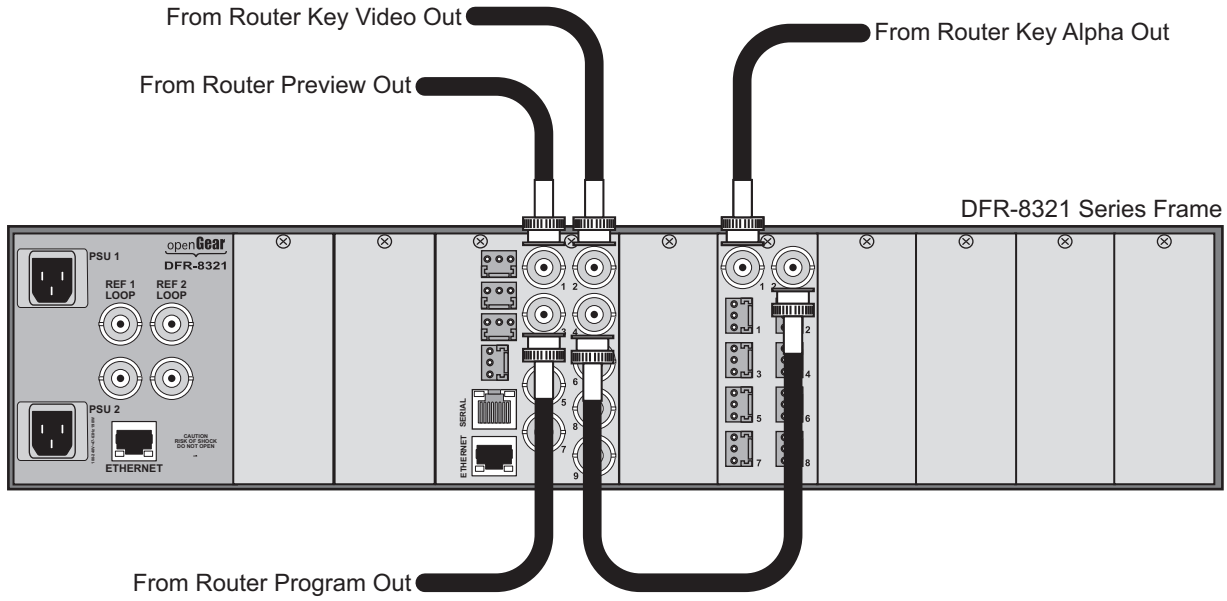



***Figure 2.4** openGear Frame Cabling — Inputs and Outputs*

## Input Mapping

The default mapping includes router inputs, but it is first necessary to configure the router outputs and crosspoints. Inputs are mapped as outlined in the section "**Source Mapping**" on page 3-6.

### *For More Information on...*

- interpreting the type of router crosspoints, refer to the section "**To establish communications between a router and the MC1-MK**" on page 3-4.

## Output Cabling

Connect your output video signals as illustrated in **Figure 2.5**. Ross Video does not supply these cables.

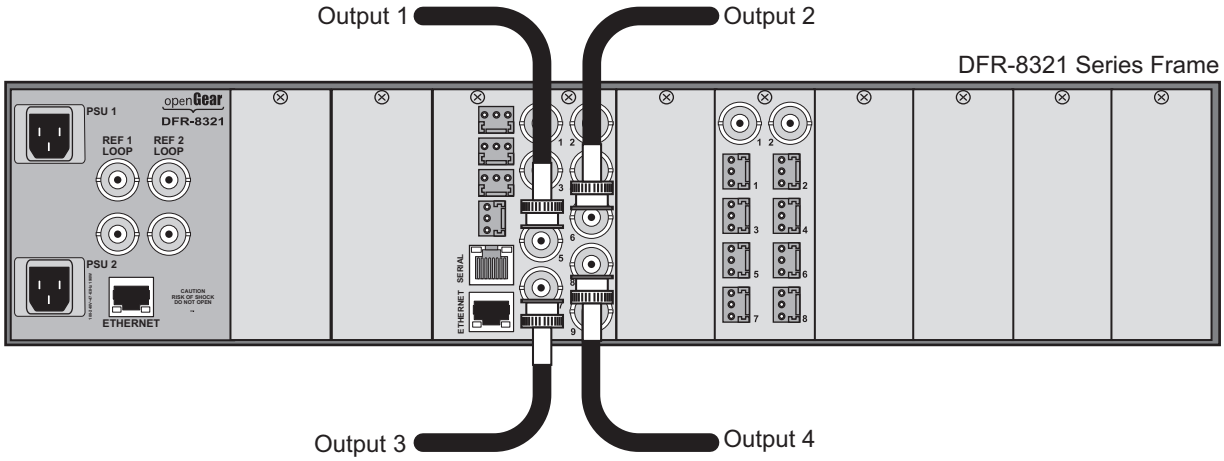



***Figure 2.5** openGear Frame Cabling — Inputs and Outputs*

## Output Mapping

By default, the following MC1-MK outputs are mapped as follows:

***Table 2.2 MC1-MK to Router Mapping***

| MC1-MK Input | Router Source |
|---|---|
| Output 1 (BNC 5) | Program |
| Output 2 (BNC 6) | Program |
| Output 3 (BNC 7) | Preview |
| Output 4 (BNC 8) | Clean Feed 1 |

### *For More Information on...*

- output mapping, refer to the section "**Selecting the Sources**" on page 4-2.

## Reference Cabling

Connect the reference source for MC1-MK as illustrated in **Figure 2.6**. Ross Video does not supply this cable.

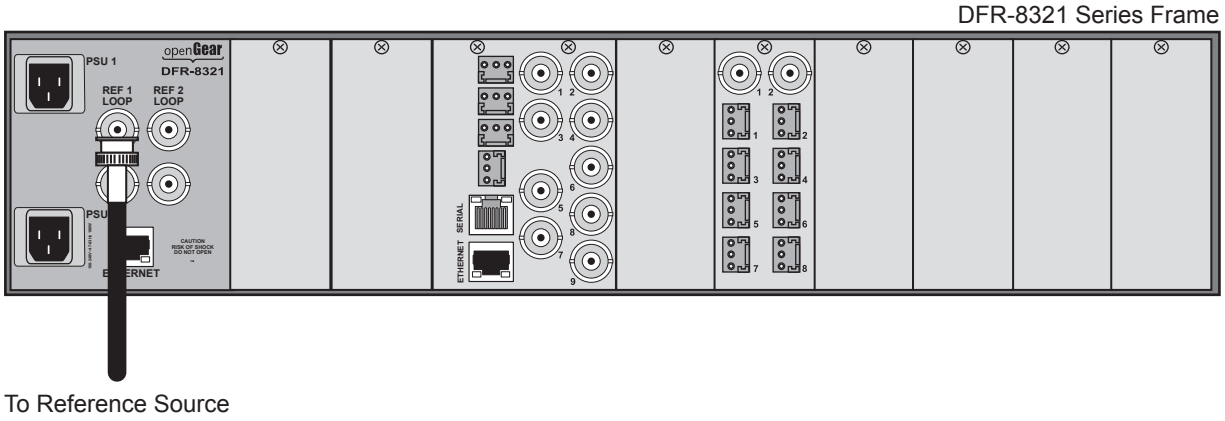



***Figure 2.6** Cabling — Reference Input*

# Ethernet Communications

The MC1-MK communicates over an ethernet connection to the router, and EAS. The **Ethernet 10/100** port on the Rear Module is also used for software upgrades, and media file transfers. The exact steps for connecting to your facility via an ethernet network depends on the network requirements of your facility. Note that in addition to the **Ethernet 10/100** port on the Rear Module, you must also provide an ethernet connection to the DFR-8321 series frame as outlined in the ***DFR-8300 Series Frames User Manual***. Set up of ethernet connections between the devices, such as a router, and the MC1-MK are outlined in later chapters of this manual.

**Important** — *Ross Video strongly recommends installing your Master Control System on a network that is segregated from your facility LAN.*

## Ethernet Cabling for the MC1-MK

Contact your IT Department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for the MC1-MK.

You will require a standard network CAT-5 cable to connect the MC1-MK to your facility network. (**Figure 2.7**) There is no need for a crossover cable as the MC1-MK includes an Auto-MDIX ethernet PHY that will switch from straight to crossover automatically as needed. Ross Video does not supply these cables.

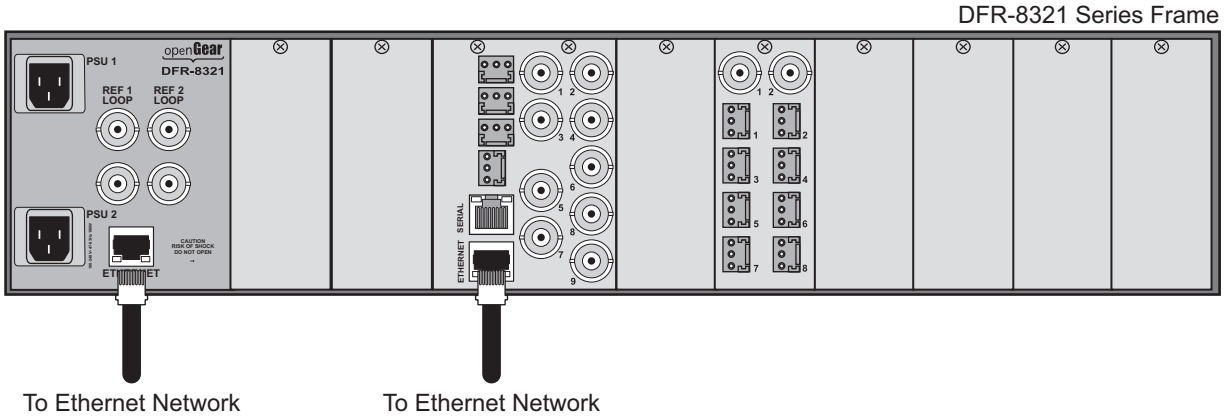
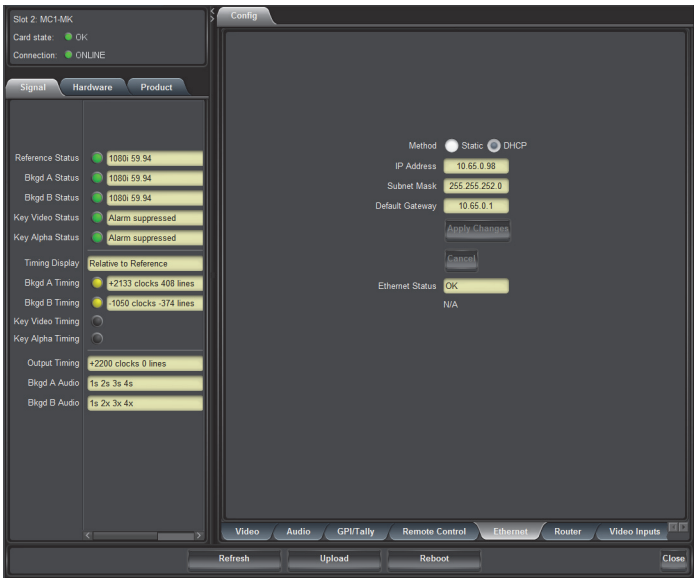



***Figure 2.7*** *MC1-MK — Ethernet Connection*

## To set up ethernet communications for the MC1-MK

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Ethernet** tab located at the bottom of the **Config** tab.




*Config — Ethernet Tab*

4. If you are manually configuring the ethernet settings:
   - Select **Static**.
   - Enter the **IP Address**, **Subnet Mask**, and **Default Gateway** settings for the card.
   - Ross Video recommends using a static IP Address.
5. If you want network settings to be automatically obtained, select **DHCP**.
6. Click **Apply Changes** to save the new settings.

# GPIO/Tally Setup

The MC1-MK has eight bi-directional pins labeled GPI/O 1-8 on the terminal block of the Rear Module. Ports are user programmable to be either an input (GPI) or an output (Tally) using the **GPI/Tally Setup** tab in DashBoard. Electrically, the ports are setup for contact closure to ground, with 4.75kohm pull-up resistor to +5V, so they default to a logical high state.

## GPI/Tally Cabling

The GPI ports are available on four 3-pin WECO® connectors located on the Rear Module. Four 3-pin mating connectors are provided with the Rear Module. (**Figure 2.8**)

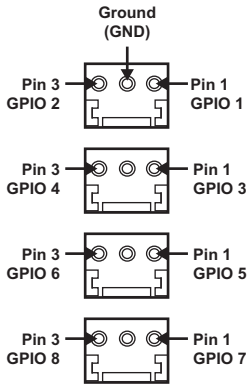
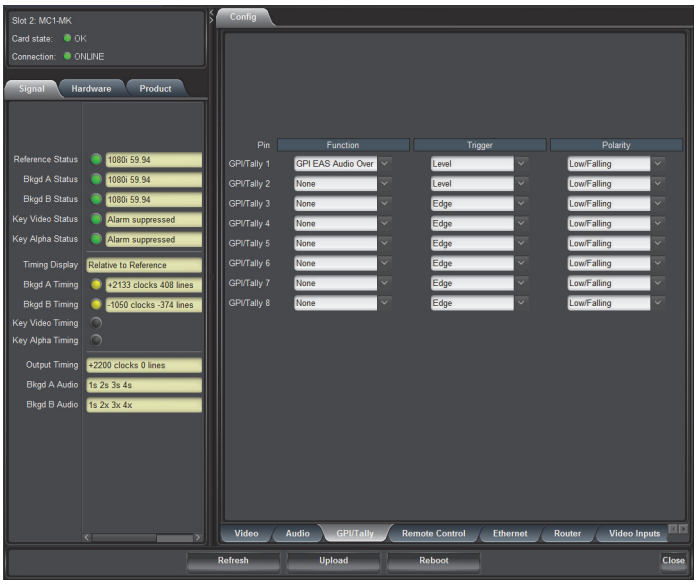



***Figure 2.8*** *Rear Module GPI Connections*

The default state for the GPI/O contacts is active low signalling. This way, if the card is removed from the openGear DFR-8321 series frame, no external events will be inadvertently asserted by the card. This also means that if a GPI cable is absent from the Rear Module, no GPI or Tally will be triggered and executed inadvertently by the card.

## To set up GPI/Tally communications for the MC1-MK

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **GPI/Tally** tab located at the bottom of the **Config** tab.




*Config — GPI/Tally Tab*

4. To configure a port as a GPI:
   - Assign a transition event to a GPI by selecting the function next to the GPI in the **GPI/Tally** area.
   - Select a trigger for the GPI from the **Trigger** column.
   - Select a Polarity for the GPI from the **Polarity** column.
5. To configure a port as a tally:
   - Select what will drive the tally output when the input is on-air by selecting the function next to the **Tally** in the **GPI/Tally** area.
   - Select the polarity of the tally from the **Polarity** column.

### *For More Information on...*

- the **GPI/Tally** tab, refer to the section "**GPI/Tally Tab**" on page 6-8.

# Linear Timecode Setup

The MC1-MK receives Linear Timecode (LTC) on the **Serial COM** port, or via the **GPI** pins, then decodes and keys the timecode over the Background video. The outgoing video signal is rendered with a known and constant delay. This section describes the two methods of cabling an LTC input to the MC1-MK: via the **Serial COM** port, or via one of the **GPIO** ports, on the rear module. Note that how you connect to the LTC device determines how you must configure the communications between the LTC device and your card.

**Note** — *If you are using an automation system that requires a serial connection, you will need to connect your LTC device using the GPIO connectors.*

## Serial Setup

Use the **Serial COM** port when the LTC device drives a balanced pair, following the recommended voltage amplitude defined in the SMPTE 12M specification. The LTC signal pair must be connected to the **Serial COM** port on the Rx+ and Rx- input pins. Ross Video does not supply this cable.

### *For More Information on...*

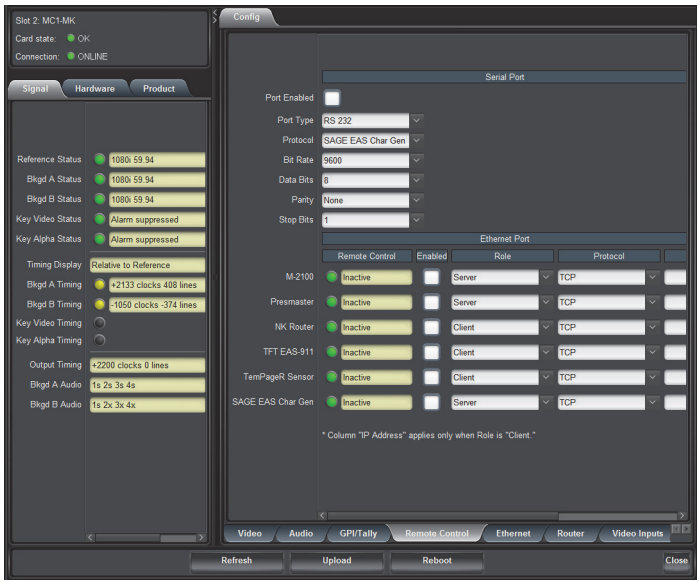
- the **Remote Control** tab, refer to the section "**Remote Control Tab**" on page 6-10.

### Cabling for the Serial COM port

You will need a cable with an RJ-45 connector on one end (connects to the **Serial COM** port on the MC1-MK rear module). Refer to the user manual for your LTC device for specific pinout information and the required port to use. Refer to **Table 7.3** on page 7-3 for cabling details.

### To configure serial communications for an LTC input

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Remote Control** tab located at the bottom of the **Config** tab.




*Config — Remote Control Tab*

4. Select **Timecode** from the **Protocol** box.
5. Select **RS 422 unterm** from the **Port Type** box.
6. Select the **Port Enabled** box. Note that when the Port is disabled, any incoming data on the serial port is discarded by the card. The **Bit Rate, Data Bits, Parity** and **Stop Bits** fields are ignored.

## GPI Setup

The GPI ports are available on four 3-pin WECO® connectors located on the Rear Module. Ross Video does not supply these cables.

**Note** — *When using a GPI port for LTC, the LTC interface must be TTL compatible where V (IH) is 2.0V-5.0V, and V(IL) is 0.0V-0.8V.*

***For More Information on...***

- the **GPI/Tally** tab, refer to the section "**GPI/Tally Tab**" on page 6-8.

### Cabling for a GPI Port

Use one of the **GPIO** ports when the LTC device drives a single-ended TTL compatible signal. The left and right pins are the two GPI/O signals while the center pin is the common Ground (GND). Refer to the section "**GPI/Tally Cabling**" on page 2-12 for cabling details.

### To configure GPI communications for an LTC input

**Note** — *Ensure that only one GPI port is configured as an LTC input at one time. If you attempt to configure a second GPI port for timecode communications, the first GPI will be automatically assigned to **None**.*

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **GPI/Tally** tab located at the bottom of the **Config** tab.
4. From the **Function** box for the GPI you are configuring, select **Timecode Input**. The **Trigger** and **Polarity** fields are ignored.

# Device Control

The MC1-MK can communicate with a number of external devices, such as EAS and automation systems.

### *For More Information on...*

- how to set up communications with these devices, refer to the Setup Sheets provided on the ***MC1-MK Documentation Resources CD*** that came with your MC1-MK.
- how to set up and configure communications with a router, refer to the chapter "**Router Setup**" on page 3-1.

# Router Setup

## In This Chapter

This chapter provides instructions for the basic physical installation and communications setup of your router to the MC1-MK. It is recommended to consult your router documentation for specific information on installing and configuring your router.

The following topics are discussed:

- Cabling
- Communications Setup
- Source Mapping

# Cabling

This section briefly summarizes how to cable the NK Series router to communicate with the MC1-MK. Note that your facility requirements may differ from what is presented here.

## Connections for the Primary NK-IPS

**Figure 3.1** illustrates the connections between a RCP-NKM, a Ross router, NK-VRC, and a (primary) NK-IPS when setting up the MC1-MK. Ross Video does not supply these cables.

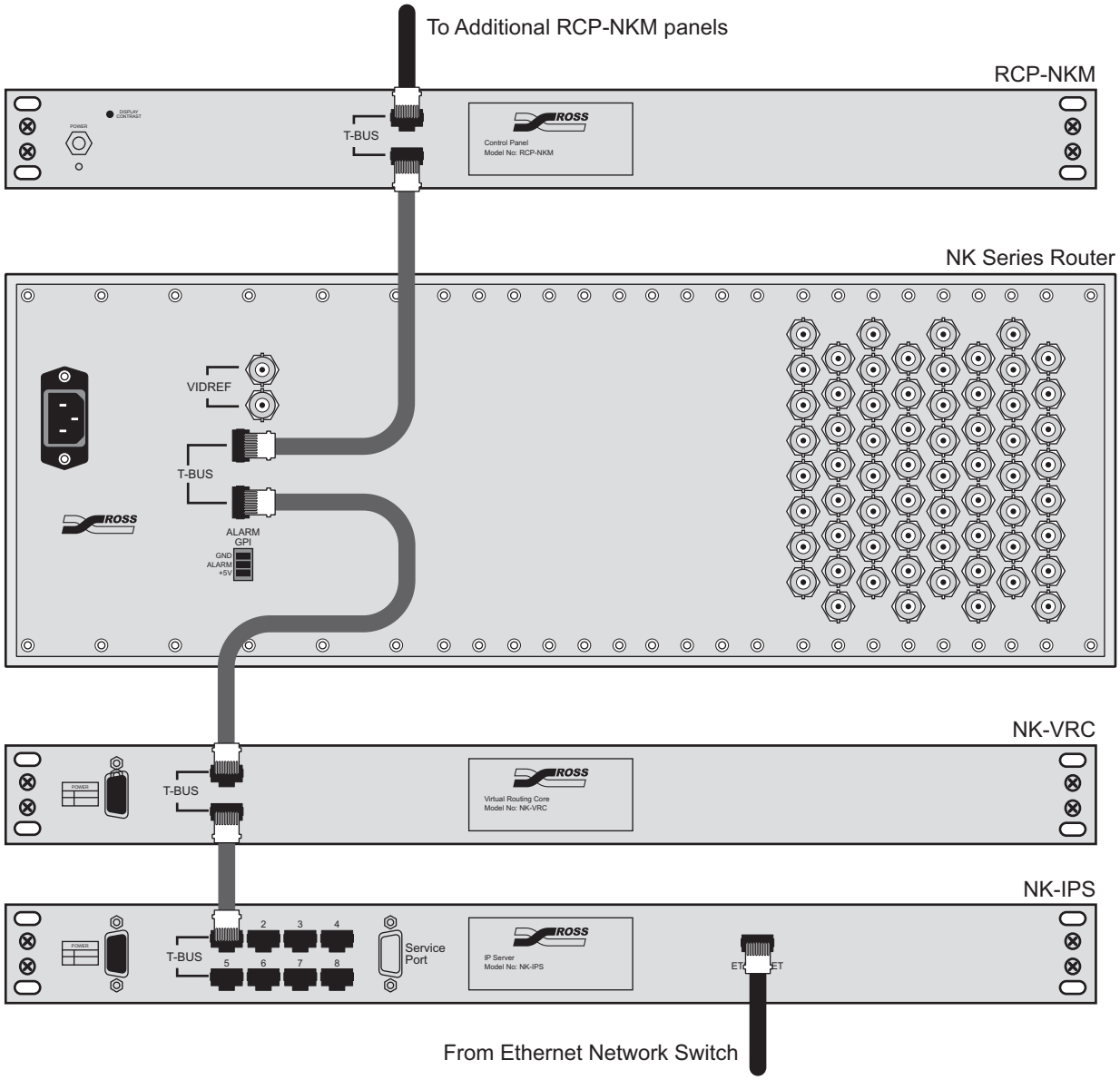



***Figure 3.1** Connections for the Primary NK-IPS*

## Connections for a Secondary NK-IPS

When using an automation device that requires a serial connection to communicate with your NK Series router, you will also need to connect your device to a NK-3RD which then connects to a second NK-IPS. (**Figure 3.2**) Note that this second NK-IPS communicates via ethernet to the first NK-IPS you setup in **Figure 3.1**.

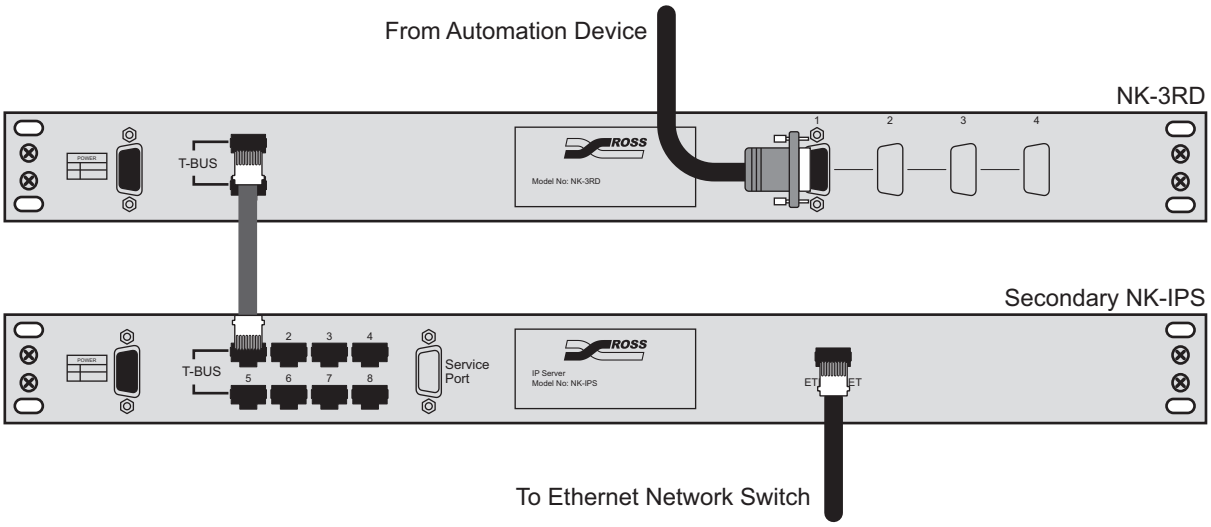



***Figure 3.2*** *Connections for a Secondary NK-IPS*

# Communications Setup

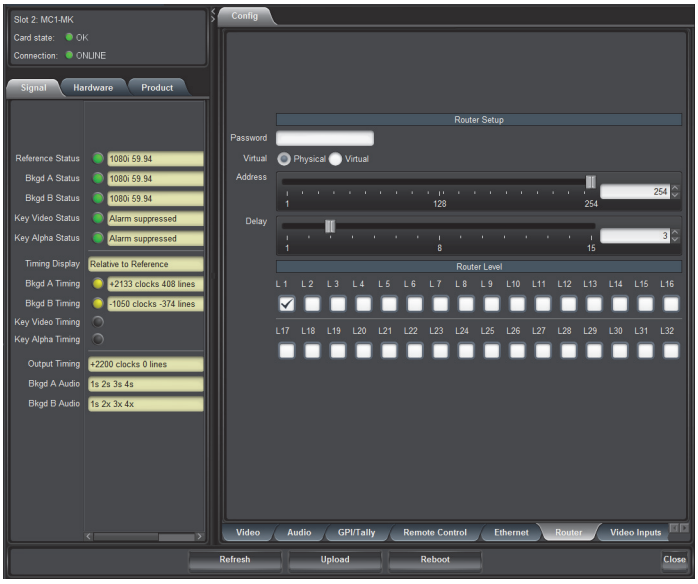
Communication between MC1-MK and the NK-IPS is via an ethernet connection. This section outlines how to configure the MC1-MK to communicate with the router via an ethernet protocol. Before proceeding, ensure that the NK-IPS is set up for ethernet communications by referring to its user manual.

### *For More Information on...*

- the **Remote Control** tab, refer to **Table 6.8** on page 6-10.
- the **Router** tab, refer to **Table 6.10** on page 6-14.

## To establish communications between a router and the MC1-MK

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Router** tab located at the bottom of the **Config** tab.

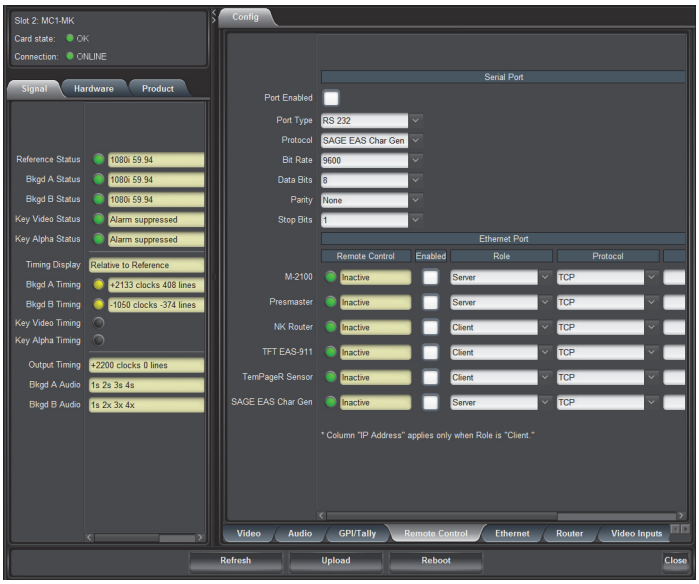



*Config — Router Tab*

4. If you have locked your NK-IPS from its interface, you must enter the required password in the **Password** field in the **Router** tab of DashBoard.
5. Specify how crosspoints are interpreted by selecting an option from the **Virtual** menu. Select **Virtual** if you are using an NK-VRC, as outlined in **Figure 3.1**.
6. Specify the length of time, in frames, that the MC1-MK will wait after sending a command to the router by entering a value in the **Delay** field.
7. Specify the T-Bus address to be used by the MC1-MK.

## To specify the communications protocol for MC1-MK

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Remote Control** tab located at the bottom of the **Config** tab.




*Config — Remote Control Tab*

4. Locate the **NK Router** row in the **Ethernet Port** area of the tab.
5. From the **Role** menu, select **Client**.
6. From the **Protocol** menu, select **TCP**.
7. From the **IP Address** menu, specify the IP Address of the NK-IPS.
8. From the **Port** menu, specify the port number of the NK-IPS. Note that the standard port used by NK-IPS is 5000.
9. Select the **Enabled** box.

# Source Mapping

Any router source can be mapped to any crosspoint button on the MC1-MK On Air Control interface using the options in the **Video Inputs** tab. Each crosspoint button can have two inputs assigned: the video source and an optional alpha source. The alpha source is used only when selecting an external key.

## Output Mapping

Four SDI video signals are normally sent from the router to the MC1-MK. These are Program, Preset, Key Video, and Key Alpha. In order for the MC1-MK to send the correct switch commands to the router, it must know which router outputs correspond to the four SDI signals. This section enables you to specify this information.

**Note** — *When interfacing the MC1-MK to an NK Series router with Resource Management, it may be necessary to limit the number of router outputs controlled by the MC1-MK.*

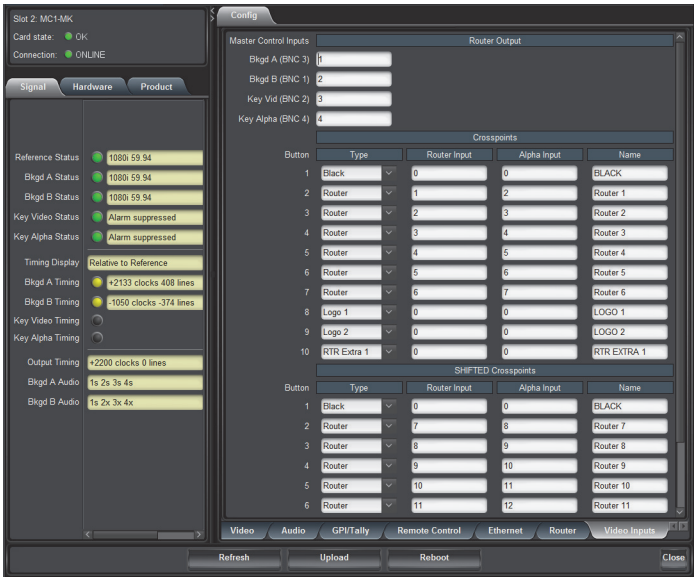
*If there are less than four format converters available, then the external key inputs of the MC1-MK must be set to zero (0). Otherwise a resource conflict may arise and this could prevent the Program or Preset bus from switching.*

### *For More Information on...*

- output cabling, refer to the section "**Video Connections**" on page 2-7.

### To map router output sources to MC1-MK inputs

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Video Inputs** tab located at the bottom of the **Config** tab.




*Config — Video Inputs Tab*

4. For each of the four SDI signals, enter the router output number in the **Router Output** field. The MC1-MK will use this value when sending switch commands to the router.
   - A value of zero (0) disables the router functionality. Use this option in situations where there are not sufficient resource converters available on the router.
   - Positive numbers (1 and up) are assumed to be valid router crosspoints. For an NK series router, the maximum value is 65535. For other routers it may be larger or smaller. The MC1-MK does not validate the number, so you must ensure that the correct value is entered.

## Crosspoint Mapping

The MC1-MK is shipped with a factory default mapping for the available inputs to the crosspoint buttons on the DashBoard control panel. **Table 3.1** outlines the default crosspoint mapping. However, you can also change the sources assigned to the router destinations that are associated with the MC1-MK using the options in the **Video Inputs** tab.

***For More Information on...***

- the menu items in the **Video Inputs** tab, refer to **Table 6.11** on page 6-15.

***Table 3.1 Default Crosspoint Mapping***

| Crosspoint Button | Unshifted Row | Shifted Row |
|---|---|---|
| **1** | Black | Black |
| **2** | Router 1 | Router 7 |
| **3** | Router 2 | Router 8 |
| **4** | Router 3 | Router 9 |
| **5** | Router 4 | Router 10 |
| **6** | Router 5 | Router 11 |
| **7** | Router 6 | Router 12 |
| **8** | Logo 1 | Logo 3 |
| **9** | Logo 2 | Logo 4 |
| **10** | RTR Extra 1 | RTR Extra 2 |
| **11** | SHIFT | SHIFT |

### Mapping the RTR Extra Buttons

By default, there are two **RTR Extra** buttons, with one mapped to each row. These buttons are provided for when your Automation system requires switches between more router sources than can be mapped to the MC1-MK crosspoint buttons. When you have more than 18 router sources to switch between, the Automation system polls the MC1-MK crosspoint rows to see if the router source is already assigned to a crosspoint button. If it is not, then the Automation system searches for a crosspoint that is assigned as **RTR Extra** and uses it to make the switch between router sources.

If you are not using an Automation system, or have less than 18 router sources to switch, you may wish to re-map these buttons to other functions. Otherwise it is recommended to keep the default mapping of one **RTR Extra** button per crosspoint row.

## To map a crosspoint button in MC1-MK

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Video Inputs** tab located at the bottom of the **Config** tab.
4. In the provided list, locate the crosspoint button you want to assign a video signal to.
5. Use the options in the **Type** menu to configure the crosspoint.
6. If you selected **Router** in the **Type** menu, use the **Router Input**, and **Alpha Input** fields as required.
7. Use the **Name** field to change the displayed name if required.

# MC1-MK Configuration

## In This Chapter

This chapter provides instructions for configuring the MC1-MK using the options available in the DashBoard Control System™.

The following topics are discussed:

- Selecting the Sources
- Audio Configuration
- Additional Configuration
- Using Multiple MC1-MK Cards
- Software Upgrades

**Note** — *Before proceeding, ensure that you are running DashBoard software version 5.0.0 or higher. The DashBoard Control System software and user manual are available to download from the Ross Video website.*

# Selecting the Sources

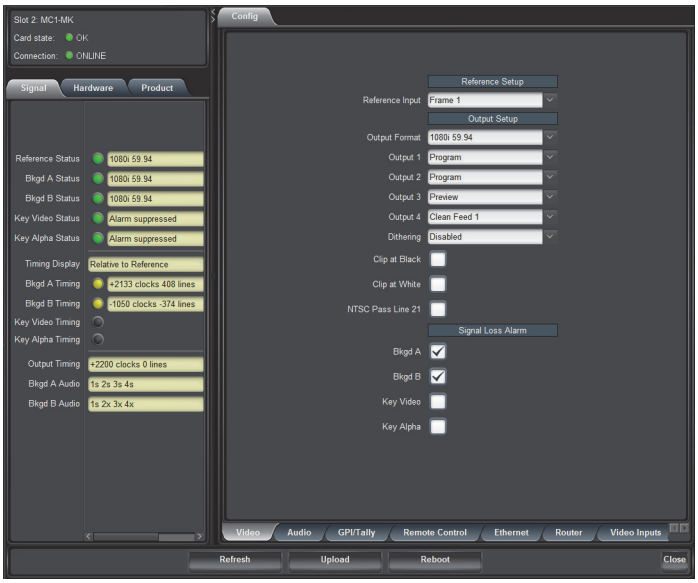
This section provides information for selecting the video format and the reference source for your card.

### *For More Information on...*

- configuring your video inputs and outputs, refer to the section "**Video Characteristics**" on page 7-5.
- assigning MC1-MK inputs to router outputs, refer to the section "**Crosspoint Mapping**" on page 3-7.
- the Signal Loss Alarm options, refer to the **Table 6.4** on page 6-5.
- the type of messages displayed in the **Timing** fields, refer to **Table 6.1** on page 6-2.

## To select the video format and reference source

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Video** tab located at the bottom of the **Config** tab.




*Config — Video Tab*

4. Select a reference source from the **Reference Input** menu.
5. Select the card output video format from the **Output Format** menu. Ensure that it is the same format as in the input video format.

**Operating Tip** — *Use the **Signal** tab to monitor the Signal status, including the reference and the Background sources. Refer to the section "**Signal Tab**" on page 6-2 for more information.*

## To configure your video outputs

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Video** tab located at the bottom of the **Config** tab.
4. From the **Output Setup** area, locate the Output BNC you want to configure.
5. Select the output destination that you want to assign to the selected Output BNC (on the rear module) from the **Output** field.
6. From the **Dithering** field, select the type of dithering you want to apply to all outputs.
7. Enable the Clip at White or Clip at Black feature(s) as required. Refer to **Table 6.4** on page 6-5 for details on these features.
8. Enable the **NTSC Pass Line 21** when using NTSC (480i) video format and when Line 21 contains closed captions.

## To set up the signal loss alarm feature

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Video** tab located at the bottom of the **Config** tab.
4. Enable or disable the alarms by selecting or clearing the required boxes in the **Signal Loss Alarm** area as needed.

# Audio Configuration

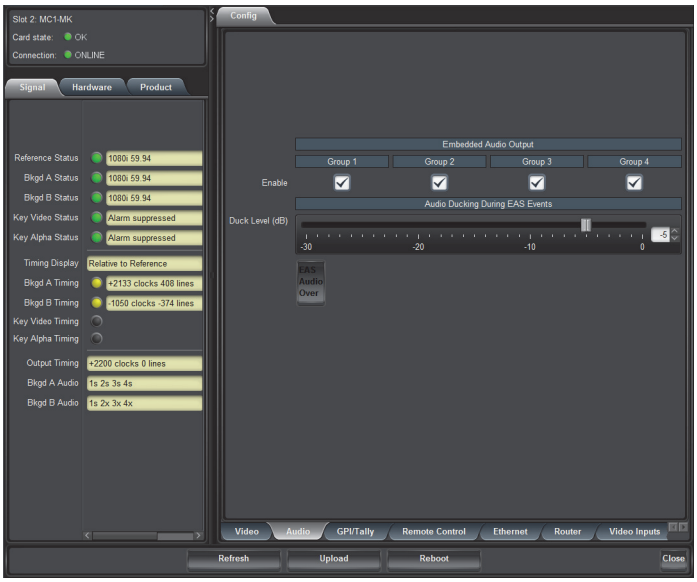
This section outlines the audio setup options such as how to specify audio groups to embed, configure the master audio level, and reduce the audio level on the Program bus during EAS alerts.

## Specifying Embedded Audio Groups

The **Audio** tab enables you to specify which audio group is embedded for outputs. By default, all groups are embedded.

### To specify which audio groups to embed

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Audio** tab.




*Config — Audio Tab*

4. Enable the embedding of each audio group by selecting the associated **Enable** check box.

## Setting the Master Audio Level

The master audio level can be adjusted manually using the Audio Gain slider.

### To set the Master Audio level

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **On Air Control** node to display the interface in the right-half of DashBoard.
3. Specify the audio gain value using the **Audio Gain** slider. You can select the **Reset Audio Gain** button to return the gain to the factory default value.

## Setting the EAS Duck Level

The **Audio** tab provides an option to specify how much the Program bus audio level is reduced when an EAS alert is active.

### To set the EAS Duck level

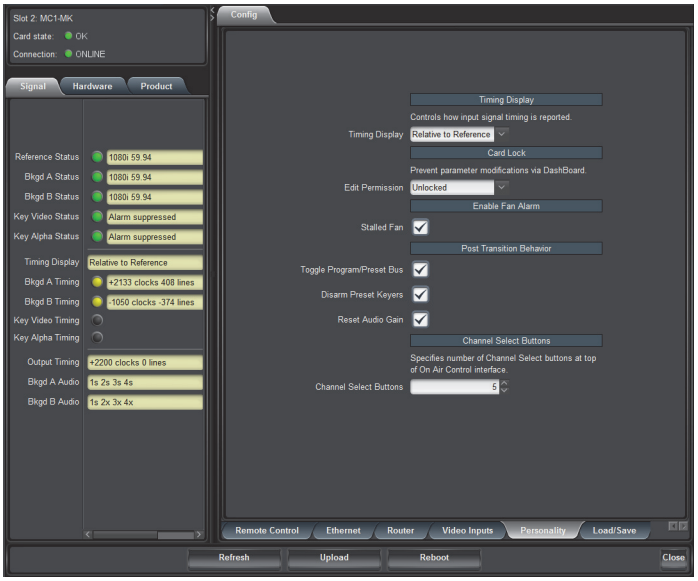
1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Audio** tab.
4. Use the **EAS Duck Level** slider to specify the amount (dB) to reduce the audio level on the Program bus.

## Resetting the Audio Gain Level During Transitions

An option in the **Personality** tab enables you to specify whether the audio gain level is reset, to the factory default value of 0dB during transition. When enabled, this option ramps the audio gain level to the default level as the Preview bus is transitioned. When disabled, this option keeps the audio gain level at the current level after the transition completes (the audio gain is not adjusted).

### To reset the audio gain level after a transition

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Personality** tab.




*Config — Personality Tab*

4. Select the **Reset Audio Gain** box to reset the audio gain level after a transition.

# Additional Configuration

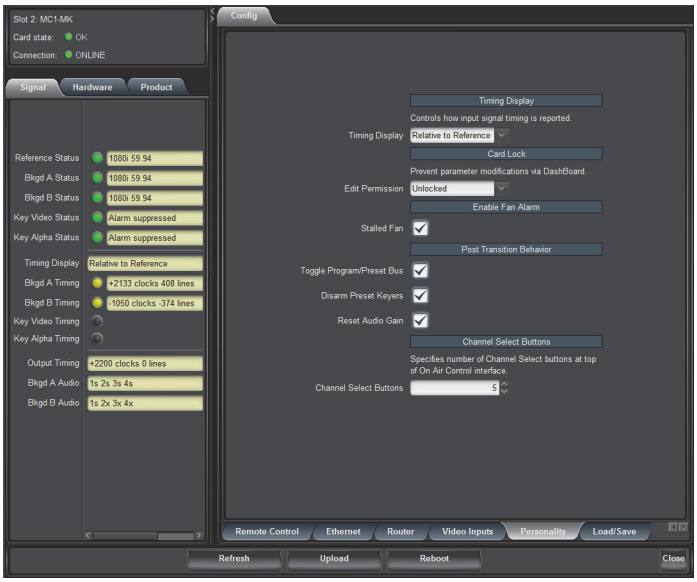
This section outlines additional communication setup such as how to configure edit permissions, and reset the MC1-MK to the default values.

## Configuring the Edit Permissions

The **Personality** tab in DashBoard enables you to lock the card permission so that parameters are read-only and cannot be changed.

### To configure the card edit permissions

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Personality** tab located at the bottom of the **Config** tab.




*Config — Personality Tab*

4. Choose an option from the **Edit Permission** menu.

## Configuring the Input Signal Timing Display

The **Timing Display** feature enables you to configure how the input signal timing is reported by DashBoard. This information is displayed in the **Bkgd A, B, Key Video,** and **Key Alpha Timing** fields of the **Signal** tab in the number of clocks and lines. Negative values indicate the input signal timing is earlier than the reference. Positive values indicate the input signal timing is later than the reference.

### To configure the input signal timing for your card

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Personality** tab located at the bottom of the **Config** tab.

4. Configure how the signal timing is reported by selecting an option from the **Timing Display** menu.

## Loading the Factory Defaults

If required, the card menu parameters can be reset to the factory default values using the option available in the **Load/Save** tab. All parameters are reset except those listed in **Table 4.1**.

***Table 4.1 Excluded Parameters From a Reset***

| Interface | Tab | Parameter that is not reset |
|---|---|---|
| Configuration | Video | Reference Input |
| | Video | Output Format |
| | Ethernet | All parameters[a] |
| | EAS Setup | **Off** button is selected[b] |
| On Air | Logo # | All logo channels are set to None[c] |
| | Time counter | If the time counter was running before the reset, it will continue counting without resetting to 00:00:00. |

a.The Ethernet Port settings in the Remote Control tab are reset to the factory default values.
b.The remaining parameters in the EAS Setup tab are not reset.
c.The logo properties (one for each image/animation) are not reset. Each image (stored on the CompactFlash™) has properties associated with it. These properties are not affected by loading the factory defaults.

### To reset the card to the factory default settings in DashBoard

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Load/Save** tab located at the bottom of the **Config** tab.
4. From the **Global Settings** area, click **Load Factory Defaults** to display the **Confirm** dialog.
5. Click **Yes** to load the factory default values for all menu parameters, or **No** to cancel the load and close the dialog.

## Auto Swapping of Program and Preset Buses

A personality option is provided that allows the user to specify the behavior of the Program and Preset buses after a transition. You can choose to have the Program and Preset bus flip-flop after a transition (default setting), or have the Preset bus unchanged after a transition.

### To swap the buses after a transition

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Personality** tab.
4. From the **Post Transition Behavior** area, select the **Toggle Program/Preset Bus** box.

## Specifying the Keyers Behavior

The Disarm Preset Keyers personality option allows the user to specify the behavior of the keyers after a transition. When this option is enabled, the keyers on the Preset bus will be turned off automatically after a transition. The operator must manually select the keyer(s) to be included in the next transition. When this option is disabled, the keyers will automatically flip-flop between Program and Preset after a transition.

### To configure the Disarm Preset Keyers option

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Personality** tab.
4. From the **Post Transition Behavior** area, select the **Disarm Preset Keyers** box.

**Note** — *The Disarm Preset Keyers option affects all Keyers unless EAS is enabled (on the Remote Control tab) in which case only Keyers 1-3 are affected.*

# Using Multiple MC1-MK Cards

When using multiple MC1-MK Master Control Switchers, it may be desirable to control any MC1-MK from a DashBoard console. To facilitate switching between multiple MC1-MK cards, a row of dedicated Channel Select buttons is provided in the upper left of the On Air Control interface. You can change the icons displayed in the Channel Select Buttons, the Basic Tree View node, and the Home tab by updating the corresponding graphic files stored on the MC1-MK card.

This section outlines how to update the icons for an MC1-MK and how to assign a MC1-MK Master Control Switcher to a Channel Select button.

## Updating the Icons

It is intended for users to update the icon graphics for each MC1-MK with their own versions, particularly if they have more than one MC1-MK. For example, you may wish to identify each MC1-MK by using a specific station logo. This section summaries the graphic files used by a card.

### Overview of the Graphic Files

The graphic files are stored on the CompactFlash™ of the MC1-MK in a top-level directory on the card named **ross**. Note that the underlying file system (ext3) is case-sensitive, and that both the directory and the filenames are lower-case. Inside the **ross** directory there are three files, containing icons (station logos) in various sizes. (**Table 4.2**) When replacing the content of these files, ensure that the image dimensions remain the same. For best results, also ensure that these images have a transparent background.

***Table 4.2 Image Files for Multi-Channel Setups***

| Filename | Image Dimensions | Used for... |
|---|---|---|
| station_logo_icon.png | 16 x 16 pixels | Basic Tree View node icon |
| station_logo_small.png | 50 x 50 pixels | Channel Select button icon |
| station_logo_large.png | 450 x 250 pixels | On Air Controls, Home tab icons |

### Managing the Graphic Files

Use an FTP client to connect to the MC1-MK and replace the graphic files stored on the card. This is exactly the same procedure as is used to load other graphics files to logo channels on the MC1-MK. Refer to the ***MC1-MK Operation Manual*** for details.

Once new files are transferred to the MC1-MK via FTP, they will immediately be used. However, DashBoard software caches the images and may not display the new icons right away. Refreshing the card (click the **Refresh** button), or restarting DashBoard, generally fixes this problem.

## Configuring the Channel Select Buttons

The Channel Select buttons are located in the upper left corner of each card's On Air Control interface. Until these are configured by the user, they appear as empty buttons. Clicking the empty buttons has no effect. You can specify the number of Channel Select buttons, to a maximum of 10, that display in the interface using an option in the Personality tab.

These buttons allow you to toggle between the On Air Control interfaces of multiple MC1-MK Master Control Switchers. Selecting a button displays the corresponding MC1-MK **On Air Control** interface in DashBoard. A lit button indicates that the corresponding On Air Control interface is the currently active card in DashBoard.

Prior to configuring the Channel Select buttons, each MC1-MK should be given a custom set of icon (station logo) graphics as described in the previous section. Channel Select buttons will operate with the default logos, but it may be confusing to the operator.

It is highly recommended to consistently assign MC1-MK cards to the Channel Select buttons. For example, assigning the same MC1-MK to the first Channel Select button regardless of the On Air Control interface ensures that the clicking the first Channel Select button displays the same MC1-MK.

## To specify the number of Channel Select buttons

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **Personality** tab located at the bottom of the **Config** tab.
4. Specify the number of buttons to display in the On Air Control interface of that MC1-MK by typing the number into the **Channel Select Buttons** field.
5. Repeat steps 1-4 for each MC1-MK you wish to configure.

## To configure the first MC1-MK

1. Display the **On Air Control** interface of the first MC1-MK as follows:
   - From the **Tree View**, expand the node for the first MC1-MK you want to access.
   - Expand the node for the first MC1-MK.
   - Double-click its **On Air Control** node.
2. Return to the **Tree View**.
3. Assign the first MC1-MK to the first Channel Select button as follows:
   - Select the **On Air Control** node and keep the mouse button pressed.
   - Drag the node over the first Channel Select button. Notice the mouse pointer changes shape when over the target button.
   - Release the mouse button. The Channel Select button updates to show the appropriate logo for the first MC1-MK.
4. Repeat step 3 for the second MC1-MK, but ensuring to assign the second MC1-MK to the second Channel Select button.
5. Assign each additional MC1-MK to a button in **On Air Control** node of the first MC1-MK. Refer to **Figure 4.1** for an example of a possible button mapping.

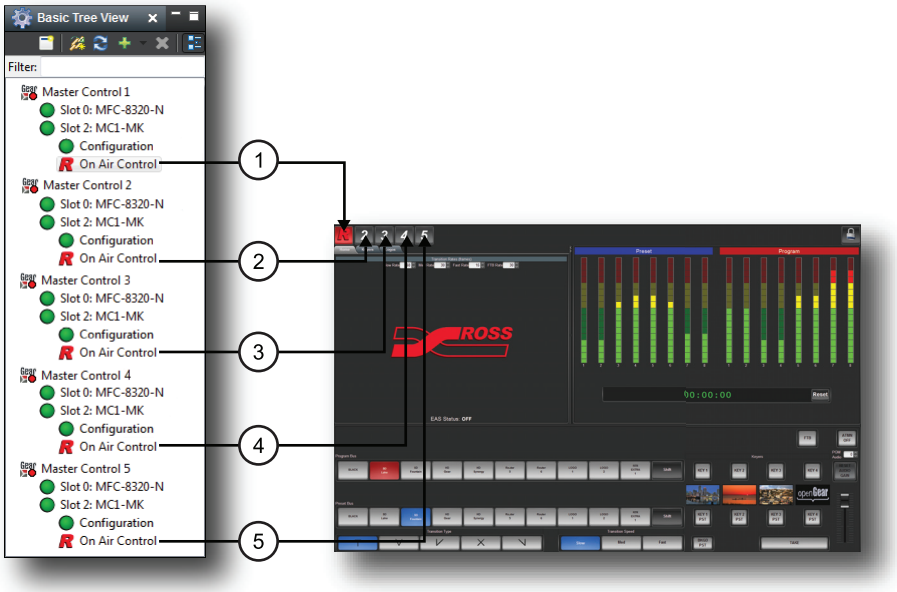



***Figure 4.1*** *Example of Assigning Multiple MC1-MK to Channel Select Buttons*

### To setup additional MC1-MK

1. Display the **On Air Control** interface of the next MC1-MK as follows:
   - From the **Tree View**, expand the node for the next MC1-MK.
   - Double-click its **On Air Control** node.
2. Return to the **Tree View**.
3. Drag the On Air Control node of the first MC1-MK to the first Channel Select button on the next MC1-MK On Air Control interface.
4. Drag the On Air Control node of the second MC1-MK to the second Channel Select button on the next MC1-MK.
5. Repeat for each additional MC1-MK to add the buttons to the On Air Control interface for each MC1-MK. Refer to **Figure 4.1** for an example of a possible button mapping.

## Notes on Using Multiple MC1-MK Cards

When setting up the Channel Select buttons, it is important that the sequence of devices be consistent. Otherwise the buttons will appear to “move around” when toggling between interfaces. This cannot be enforced automatically, the user must be careful when setting up the buttons.

If the IP address of either MC1-MK cards changes, then the Channel Select buttons will not work correctly. Specifically, the red background color that indicates the currently active device will not be correct. It is highly recommended to use static IP addresses to avoid this problem.

If either of these problems occur, they can easily be fixed by simply repeating the procedure “**Configuring the Channel Select Buttons**” on page 4-9.

# Software Upgrades

The card can be upgraded in the field using the **Ethernet 10/100** port on the Rear Module and using the options available in DashBoard. Refer to the section "**Ethernet Communications**" on page 2-10 for setting up ethernet communications.

## To upgrade the software on a card

1. Contact Ross Technical Support for the latest software version file.
2. Ensure the ethernet cable is connected to the **Ethernet 10/100** port on the Rear Module. Refer to the section "**Ethernet Cabling for the MC1-MK**" on page 2-10 for details.
3. From the **Tree View**, expand the node for the MC1-MK you want to access.
4. Select the **Configuration** node to display the interface in the right-half of DashBoard.
5. Select **Upload**, located near the bottom of the Config tab, to display the **Select file Upload** dialog.
6. Navigate to the ***.bin** file you want to upload.
7. Click **Open**.
8. If you are upgrading a single card, click **Finish** to start the upgrade. Proceed to step 10.
9. If you are upgrading multiple cards:
   - Click **Next >** to display the **Select Destination menu**. This menu provides a list of the compatible cards.
   - Specify the card(s) to upload the file to by selecting the check box(es) for the cards you want to upload the file to.
   - Verify the card(s) you want to upload the file to. The **Error/Warning** fields indicate any errors, such as incompatible software or card type mismatch.
   - Click **Finish**.
10. Monitor the upgrade.
    - An **Upload Status** dialog enables you to monitor the upgrade process.
    - Notice that each card is listed in the dialog with a button. This button is replaced with a **Reboot** button once the software file is loaded to that card.

**Important** — *Avoid clicking the individual **Reboot** buttons until all cards have successfully completed the file upload process and the **OK** button, located in the bottom right corner of the dialog, is enabled.*

- Click **OK** to reboot all the cards listed in the **Uploading to Selected Devices** dialog.
- The **Reboot Confirm** dialog displays, indicating the number of cards that will reboot. Click **Yes** to continue the upgrade process. Note that clicking **Cancel** or **No** returns you to the **Uploading to Selected Devices** dialog without rebooting the card(s).
- The card(s) are temporarily taken offline during the reboot process. The process is complete once the status indicators for the **Card State** and **Connection** return to their previous status.

# Configuring the Text Overlay

## In This Chapter

The text overlay feature of the MC1-MK is capable of displaying one layer of text in real time that contains EAS text crawls. This chapter provides a summary of using the text overlay feature of the MC1-MK. Refer to the Setup Sheet for your EAS device for information on installing and configuring your device to communicate with the MC1-MK.

The following topics are discussed:

- Customizing the EAS Text Overlay

# Customizing the EAS Text Overlay

The MC1-MK provides an overlay engine that is capable of displaying an EAS horizontal text crawl in real time. EAS messages are grouped into categories in the **EAS Setup** tab as determined by the EAS device you are using. The **EAS Setup** tab provides options for customizing the appearance of each message category such as font size and color, background color, and pan speed. Refer to the ***FCC's EAS regulations at 47 C.F.R. Part 11*** for more information on message categories.

By default, the overlay is automatically loaded into Logo 4 and associated with Keyer 4 of the MC1-MK (but is not fixed). Ross Video strongly recommends leaving Logo 4 assigned to Keyer 4 to ensure that EAS text crawls output properly.

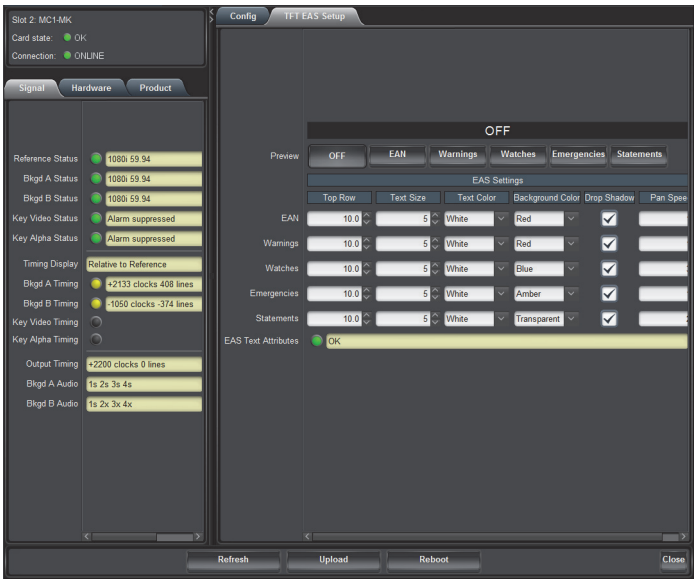
**Note** — *The settings in the EAS Setup tab are not restored using DataSafe™, nor when porting configuration data from a setup file or another card. These settings are also not affected when you load the factory default values.*

### *For More Information on...*

- setting up an EAS with the MC1-MK, refer to the MC1-MK setup sheet for your device. This setup sheet is available on the ***MC1-MK Documentation Resources CD*** that accompanied your MC1-MK.
- the **TFT EAS Setup** tab, refer to **Table 6.14** on page 6-19.
- the **Sage EAS Setup** tab, refer to **Table 6.15** on page 6-21.

## To customize the EAS text overlay

1. From the **Tree View**, expand the node for the MC1-MK you want to access.
2. Select the **Configuration** node to display the interface in the right-half of DashBoard.
3. Select the **EAS Setup** tab located beside the **Config** tab. If the EAS Setup tab is unavailable, verify that you have correctly installed your EAS device and it is communicating with the MC1-MK.




*EAS Setup Tab — TFT EAS 911*

4. From the **Preview** area, select the type of event message you want to customize. The following will occur once you select a category button:
   - The **EAS Setup** tab settings display the stored values for the selected category.

- A test EAS message automatically displays on the Preset bus (the **Key 4 PST** button is now lit). This enables you to verify your changes to the EAS text overlay.

5. Use the **Top Row** slider to adjust the vertical position of the EAS text overlay. Note that this setting is not applicable to the Emergency Alert (High Priority) categories as these messages are fixed to the top of the screen.
6. Use the **Text Size** slider to adjust the font size of the text overlay from smallest (1) to largest (10). Note that actual text size is dependent on the video format.
7. Select a text color and/or background color for the text overlay using the provided fields. The **EAS Text Attributes** field reports an error when the text color and the background color match.

**Note** — *When using very long EAS messages, the MC1-MK may use a smaller font size and/or may disable transparency. The exact length depends on the characters used in the message (widths of each font character).*

8. To apply a drop shadow to the text overlay, select the **Drop Shadow** box.
9. Use the **Pan Speed** slider to specify the speed of the EAS text crawl across the screen.
10. Repeat step 4. to step 9. for each message category you want to configure.
11. Select **Off** from the **Preview** to disable the EAS text crawl. The Preset bus no longer displays a test EAS message, and the **Key 4 PST** button is no longer lit.

# Appendix A. DashBoard Menus

## In This Appendix

This appendix briefly summarizes the installation menus, items, and parameters available in the MC1-MK Configuration interface. Default values are noted with an asterisk (*). Some fields in the Device View vary in severity from green (valid), yellow (caution), to red (alarm). DashBoard reports the most severe alarm for a single field. Alarm colors are noted within the tables as text set in brackets next to the menu parameter name.

**Note** — *Before proceeding, ensure that you are running DashBoard software version 5.0.0 or higher. The DashBoard Control System software and user manual are available to download from the Ross Video website.*

The following topics are discussed:

- Status Tabs
- Video Tab
- Audio Tab
- GPI/Tally Tab
- Remote Control Tab
- Ethernet Tab
- Router Tab
- Video Inputs Tab
- Personality Tab
- Load/Save Tab
- TFT EAS Setup Tab
- Sage EAS Setup

# Status Tabs

This section summarizes the read-only information displayed in the **Status** tabs.

## Signal Tab

**Table 6.1** summarizes the information displayed in the **Signal** tab.

***Table 6.1 Signal Tab Items***

| Tab Title | Item | Parameters | Description |
|---|---|---|---|
| **Signal (Read-only)** | Reference Status | No reference (Red) | No signal detected on selected reference input |
| | | Reference Unlocked (Red) | Signal detected, but not locked (or lock lost) |
| | | Invalid Reference (Red) | Signal detected, but incompatible with the current video mode |
| | | Unknown | No signal present, or format is not recognized |
| | | 480i 59.94 (Green) | Valid Composite NTSC reference detected |
| | | 720p 59.94 (Green) | Valid Progressive format at 59.94Hz detected |
| | | 1080i 59.94 (Green) | Valid Tri-level sync at 59.94Hz detected |
| | | 576i 50 (Green) | Valid Composite PAL reference detected |
| | | 720p 50 (Green) | Valid Progressive format at 50Hz detected |
| | | 1080i 50 (Green) | Valid Tri-level sync at 50Hz detected |
| | | 1080pSF 24 (Green) | Valid Progressive segmented frames at 24Hz detected |
| | | 1080pSF 23.98 (Green) | Valid Progressive segmented frames at 23.98Hz detected |
| | Bkgd A Status | OK (Green) | Normal operation |
| | | Alarm Suppressed (Green) | An alarm condition exists but is silenced |
| | | Invalid Signal (Yellow) | Signal detected but format not recongized |
| | | Incompatible format (Yellow) | Signal present but format does not match the video output format configuration of the card |
| | | No signal (Red) | No signal present on the input |
| | Bkgd B Status | Same parameters as above | |
| | Key Video Status | Same parameters as above | |
| | Key Alpha Status | Same parameters as above | |
| | Timing Display | Relative to Reference | The **Bkgd Timing** fields display the input signal timing values relative to the selected analog reference |
| | | Input to Output | The **Bkgd Timing** fields display the input signal timing values relative to the SDI output of the card |

*Table 6.1 Signal Tab Items*

| Tab Title | Item | Parameters | Description |
|---|---|---|---|
| **Signal (Read-only)** | Bkgd A Timing | ## Clocks ## lines | Indicates the timing of the BKGD A input signal as specified in the **Timing Display** feature |
| | | Green | The BKGD A input signal is within the valid range |
| | | Yellow | The BKGD A input signal is outside the valid range; a vertical shift will occur[a] |
| | | Grey | The BKGD A input signal is not available |
| | Bkgd B Timing | Same parameters as above | |
| | Key Video Timing | Same parameters as above | |
| | Key Alpha Timing | Same parameters as above | |
| | Output Timing | ## Clocks ## lines | Indicates the timing of the output signals relative to the reference |
| | Bkgd A Audio | 1# 2# 3# 4# | Displays the audio status for each of the four audio groups where 1-4 indicates the group and # indicates the status of the group as follows:<br>• an **s** indicates the presence of synchronous audio on the group<br>• an **x** indicates that audio is not present<br>• an **a** indicates the presence of asynchronous audio on the group |
| | Bkgd B Audio | Same parameters as above | |

a. The inputs on the card are line-synchronized. Therefore, in order to avoid vertical shifts of the video, the input signals must be timed within approximately +/- 0.5 line.

## Hardware Tab

**Table 6.2** summarizes the information displayed in the **Hardware** tab.

*Table 6.2 Hardware Tab Items*

| Tab Title | Item | Parameters | Description |
|---|---|---|---|
| **Hardware (Read-only)** | HW Status | OK (Green) | Normal operation; no hardware errors and the correct rear module is installed |
| | | Incomp I/O Module (Red) | Card is connected to the wrong rear module |
| | Voltage (V) | # | Supply Voltage, in Volts |
| | Current (mA) | # | Current consumption of card in milliAmperes |
| | Power (W) | # | Power consumption of card in Watts |
| | FPGA Temp | ##C[a] / ##F | FPGA core temperature |
| | FPGA Fan | # RPM (Green) | Indicates the card fan speed. |
| | | (Red) | If the **Stalled Fan** alarm is enabled on the Personality tab, this field reports when the card fan is not operating correctly. |

*Table 6.2 Hardware Tab Items*

| Tab Title | Item | Parameters | Description |
|---|---|---|---|
| **Hardware (Read-only)** | CPU Usage | x.xx/y.yy/z.zz[b] | CPU Load average |
| | RAM Available | #/## | CPU Memory Used / Total CPU Memory |
| | CF Card Status | #.## of 2.0 GB used | Displays the amount of memory used on the CompactFlash® card |
| | | Missing or unreadable | One of the following is occurring:<br>• CompactFlash card is not present'<br>• An error has occurred such as incompatible CompactFlash card, or an error reading the card |
| | Playout RAM | a/b/c/d | Displays RAM memory usage where:<br>• **a** represents the memory in use<br>• **b** represents the memory cache from previously loaded files<br>• **c** represents the memory dedicated to the frame sync buffers and related functions. Note that this memory is unavailable for images and animations.<br>• d represents the total playout memory |

a. A warning is displayed in DashBoard when the FPGA Core Temperature reaches 85°C. If the temperature reaches 100°C, the card will automatically shut down to avoid permanent damage and will have to be reset, rebooted, or power cycled to resume normal operation.

b. The CPU Load average is displayed in the following format: x.xx represents in the last minute, y.yy represents the last five minutes and z.zz is the last fifteen minutes.

## Product Tab

**Table 6.3** summarizes the information displayed in the **Product** tab.

*Table 6.3 Product Tab Items*

| Tab Title | Item | Parameters | Description |
|---|---|---|---|
| **Product (Read-only)** | Product | MC1-MK | |
| | Supplier | Ross Video Ltd. | |
| | Board Rev | ## | Indicates the board issue |
| | Serial Number | ###### | Indicates the board serial number |
| | Rear Module | # | Indicates the type of Rear Module in this slot |
| | Software Rev | #.# build ### | Indicates the software and build versions |
| | Firmware Rev | ##.## | Indicates the FPGA version number |

# Video Tab

The following table summarizes the **Video** tab options available in Dashboard.

***Table 6.4 Video Tab Options***

| Menu Title | Item | Parameters | Description |
|---|---|---|---|
| **Reference Setup** | Reference Input | Frame 1* | Select this option to use the reference source connected to the **FRAME REF 1** port on the DFR-8321. |
| | | Frame 2 | Select this option to use the reference source connected to the **FRAME REF 2** port on the DFR-8321. |
| | | Local | Select this option to use the external reference source connected to **REF IN** on the Rear Module (BNC 9). Use **J7** on the card to enable or disable a 75ohm terminator on the External Reference input. Refer to the section "**Card Overview**" on page 2-3 for information on configuring **J7**. |
| **Output Setup** | Output Format | 480i 59.94 | The format of the output signal of the card |
| | | 720p 59.94 | |
| | | 1080i 59.94 | |
| | | 576i 50 | |
| | | 720p 50 | |
| | | 1080i 50 | |
| | | 1080pSF 24 | |
| | | 1080pSF 23.98 | |
| | Output 1 | Program* | Assigns the source to the Program output |
| | | Preview | Assigns the source to the Preview output |
| | | Clean Feed # | Assigns the source to one of the Clean Feeds |
| | Output 2 | Same parameters as above[a]. | |
| | Output 3 | Same parameters as above[b]. | |
| | Output 4 | Same parameters as above[c]. | |
| | Dithering | Disabled* | Dithering is disabled |
| | | Enabled - low | Dithering is enabled and set to 2bits |
| | | Enabled - med | Dithering is enabled and set to 3bits |
| | | Enabled - high | Dithering is enabled and set to 4bits |
| | Clip at Black | Selected | Enables the card to clip to SMPTE black on all outputs |
| | | Cleared* | SuperBlack is not clipped (allows super-black) |
| | Clip at White | Selected | Enables the card to clip to SMPTE white on all outputs |
| | | Cleared* | SuperWhite is not clipped (allows super-white) |

***Table 6.4 Video Tab Options***

| Menu Title | Item | Parameters | Description |
|---|---|---|---|
| **Output Setup** | NTSC Pass Line 21 | Selected | Line 21 passes through unaltered. This setting should only be used when closed-captioning, or other data, is present on Line 21. |
| | | Cleared* | Line 21 is treated as active video |
| **Signal Loss Alarm** | Bkgd A | Selected* | An alarm is triggered when a missing or an invalid signal is detected on the BKGD A input source on Input 3 |
| | | Cleared | The alarm is suppressed when a missing or an invalid signal is detected on the BKGD A input |
| | Bkgd B | Selected* | An alarm is triggered when a missing or an invalid signal is detected on the BKGD B input source on Input 1 |
| | | Cleared | The alarm is suppressed when a missing or an invalid signal is detected on the BKGD B input |
| | Key Video | Selected* | An alarm is triggered when a missing or an invalid signal is detected on the Key Video input source on Input 2 |
| | | Cleared | The alarm is suppressed when a missing or an invalid signal is detected on the Key Video input |
| | Key Alpha | Selected* | An alarm is triggered when a missing or an invalid signal is detected on the Key Alpha input source on Input 4 |
| | | Cleared | The alarm is suppressed when a missing or an invalid signal is detected on the Key Alpha input |

a. The default value is Program.
b. The default value is Preview.
c. The default value is Clean Feed 1.

# Audio Tab

**Table 6.5** summarizes the **Audio** options available in DashBoard.

***Table 6.5 Audio Menu Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Embedded Audio Output - Group #** | Enable | Selected* | The specified audio group is embedded into the output |
| | | Cleared | The specified audio group is not embedded |
| **Audio Ducking During EAS Events** | EAS Duck Level (dB) | -30 to 0[a] | Determines how much the audio level on the Program bus is reduced while an EAS alert is active |

a. The default value is -10dB.

# GPI/Tally Tab

The menu items available in the **GPI/Tally Setup** tab enable you to configure the functions, trigger, and polarity of each GPI connected to the MC1-MK.

## GPI Configuration

The following table summarizes the GPI menu options in the **GPI/Tally Setup** tab.

***Table 6.6 GPI Setup Menu Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **GPI #** | Function | GPI Cut Key # | The key is cut on-air or off-air when this GPI input is triggered |
| | | GPI Auto Key # | An auto transition is performed to bring the key on-air or off-air when this GPI input is triggered |
| | | GPI Fade to Black | A fade to black is performed when this GPI input is triggered |
| | | None* | The GPIO port is not configured and the GPI has no effect |
| | | GPI EAS Audio Over | Configures the GPI port communicate with an EAS device to receive an EAS audio voice over when this GPI is triggered |
| | | Timecode Input | The GPIO port is used to communicate with an LTC device to input timecode. The **Trigger** and **Polarity** settings are ignored. |
| | Trigger | Edge* | Performs the function when a transition edge is detected on the GPI input. The Low-to-High or High-to-Low active edge is set by the Polarity control. |
| | | Level | Performs the function when a voltage level is driven on the GPI input. The voltage level High or Low is set by the Polarity control. |
| | Polarity | High/Rising | Sets the polarity of the edge or level trigger. In the case of edge trigger, a Low-to-High transition starts the function. In the case of level trigger, a high level starts the function. |
| | | Low/Falling* | Sets the polarity of the edge or level trigger. In the case of the edge trigger, a High-to-Low transition starts the function. In the case of level trigger, a low level starts the function. |

## Tally Configuration

The menu items available in the **GPI/Tally** tab enable you to configure each Tally.

***Table 6.7 Tally Setup Menu Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Tally #** | Function | Tally Bkgd A | Configures the GPI/O port as an output and reflects the on-air status of BKGD A |
| | | Tally Key Video | Configures the GPI/O port as an output and reflects the on-air status of the Key Video |
| | | Tally Key Alpha | Configures the GPI/O port as an output and reflects the on-air status of the Key Alpha |
| | | Tally Key # | Configures the GPI/O port as an output and reflects the on-air status of the Key Video |
| | | Tally Any Key | Configures the GPI/O port as an output; the Tally active when any of the Keys are on-air |
| | | None* | The GPI/O port is not configured and the tally has no effect |
| | Trigger | | This field is ignored when the port is configured as a tally |
| | Polarity | High/Rising | When asserted, the Tally output is driven High |
| | | Low/Falling* | When asserted, the Tally output is driven Low |

# Remote Control Tab

The **Remote Control** tab enables you to set up serial and ethernet communications between the MC1-MK and an external device. Note that the default values for the Port Type, Bit Rate, Data Bits, Parity, and Stop Bits values change depending on the Protocol selected.

**Note** — *A protocol can only be active on the serial port, or on the ethernet port, but not both. Should you attempt to enable the same protocol on both ports, the card automatically disables the first port (the **Enabled** box is cleared).*

***Table 6.8 Remote Control Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Serial Port**[a] | Port Enabled | Selected | Enables the serial port on the Rear Module to communicate with a serial device |
| | | Cleared* | Disables the serial port on the Rear Module |
| | Port Type | RS 232 | Select this option if the card is connected to an external device that uses the RS-232 (TIA/EIA-232) transmission standard. |
| | | RS 422 | Select this option if the card is connected to an external device that uses the RS-422 (TIA/EIA-422) transmission standard. In this mode, the Rx receive end is terminated with a 120ohm resistor on the card. |
| | | RS 422 unterm | Select this option if the card is connected to an external device that uses an unterminated RS-422 transmission standard. In this mode, the Rx receive end is not terminated on the card. This mode is used to daisy-chain several card Rx ports, where only the last one would be terminated. This setting is recommended when the **Protocol** is set to **Timecode**. |
| | | RS 422 NULL | Select this option if the card is connected to an external device that uses the standard RS-422 transmission standard with a null pinout. In this mode, the Rx and Tx are swapped on the card port and the Rx receive end is terminated with a 120ohm resistor on the card. |
| | | RS 422 NULL unterm | Select this option if the card is connected to an external device that uses the standard RS-422 unterminated transmission standard with a null pinout. In this mode, the Rx and Tx are swapped on the card port and the Rx receive end is not terminated on the card. This mode is used to daisy-chain several card Rx ports, where only the last one would be terminated. |
| | | None* | No transmission standard is specified. |
| | Protocol | M-2100 | This option is not fully implemented and should not be used. |
| | | Timecode | Select this option if you are communicating with an LTC device. Refer to the section "**Linear Timecode Setup**" on page 2-14. |

*Table 6.8 Remote Control Tab Items*

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Serial Port[a]** | Protocol | Presmaster | Select this option if the external device connected to the Serial COM port requires the Miranda™ Presmaster protocol to communicate with the MC1-MK |
| | | TFT EAS-911 | Select this option if the external device connected to the Serial COM port requires the TFT, Inc.™ EAS-911 protocol to communicate with the MC1-MK |
| | | SAGE EAS Char Gen | Select this option if the external device connected to the Serial COM port requires the Sage EAS Generic Character Generator protocol to communicate with the MC1-MK |
| | Bit Rate | 9600 | Selects the bit rate for the external device connected to the Serial COM port |
| | | 19200 | |
| | | 38400 | |
| | | 57600 | |
| | | 115200 | |
| | Data Bits | 7 | Sets the number of data bits transmission (character length) |
| | | 8 | |
| | Parity | None | Sets the Parity type |
| | | Even | |
| | | Odd | |
| | Stop Bits | 1 | Sets the number of stop bits transmission |
| | | 2 | |
| **Ethernet Port[b]** | Remote Control | Inactive (Green) | **Enabled** box is not selected for this protocol |
| | | Connected (Green) | • **Enabled** box is selected for this protocol<br>• **Role** is set to **Client**<br>• Specified IP address and Port number are valid<br>• MC1-MK has successfully established connection to the given IP address and port |
| | | Listening (Green) | • **Enabled** box is selected for this protocol<br>• **Role** is set to **Server**<br>• Specified Port number is valid<br>• MC1-MK is ready to accept connections on the specified port |
| | | Reconnecting (Yellow) | • **Enabled** box is selected for this protocol<br>• **Role** is set to **Client**<br>• MC1-MK attempts to connect periodically to the specified IP address and Port number. The interval between connection attempts start at 10 seconds, increases by 10 seconds, to a maximum of 60 seconds. |

*Table 6.8 Remote Control Tab Items*

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Ethernet Port**[b] | Remote Control | Connecting (Yellow) | • **Enabled** box is selected for this protocol<br>• **Role** is set to **Client**<br>• MC1-MK is attempting to connect to the specified IP address and Port Number |
| | | Port in use (Red) | • **Enabled** box is selected for this protocol<br>• **Role** is set to **Server**<br>• Port Number specified in the Port field is invalid or in use by another device |
| | | Cannot connect (Red) | • **Enabled** box is selected for this protocol<br>• **Role** is set to **Client**<br>• Specified IP address and Port Number are invalid or in use by another device |
| | Enabled | Selected | Enables the specified communication protocol on the ethernet port |
| | | Cleared* | Disables the specified communication protocol on the ethernet port. When the check box is cleared, any incoming data from the serial device is discarded by the card. |
| | Role | Server* | MC1-MK function as a host, or socket listener, on the network |
| | | Client | MC1-MK functions as a service requester that initiates communications with a server |
| | Protocol | TCP* | Select this option if your device is connected to the card through a network and uses the Transmission Control Protocol (TCP/IP) |
| | | UDP | Select this option if your device is connected to the card through a network and uses the User Datagram Protocol (UDP/IP). |
| | Port | #[c] | When **Role** is set to **Server**:<br>• specifies the TCP or UDP port numbers where the MC1-MK will listen on.<br>• TCP ports 0, 21, 80, 5253, and 6667 are unavailable for ethernet communications<br>When **Role** is set to **Client**:<br>• specifies the remote port number to which the MC1-MK will try to connect |
| | | #[c] | Specifies the port number of the external device when **Role** is set to **Client** |
| | IP Address | #.#.#.# | • Only applicable when **Role** is set to **Client**<br>• Specifies the IP address of the external device. The default is 0.0.0.0 and this must be changed to the actual IP address of the external device |

a. The default values for the Serial Port parameters, bit rate, data bits, parity, and stop bits are protocol dependent.
b. Each ethernet protocol is listed as a separate row in the Ethernet Port area of the tab.
c. The default values are 9000, 9001, 9002, 9003, and 9004.

# Ethernet Tab

The **Ethernet** tab enables you to set up network communications for your card.

***Table 6.9 Ethernet Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Ethernet** | Method | Static | User manually supplies the Ethernet settings. This is the recommended setting. |
| | | DHCP* | Automates the assignment of the Ethernet settings |
| | IP Address | ###.###.###.### | The IP Address for the card |
| | Subnet Mask | ###.###.###.### | The subnet mask for the card |
| | Default Gateway | ###.###.###.### | The gateway for communication outside of the local area network (LAN) |
| | Apply Changes | | Applies and saves any changes made to the **Ethernet Settings** |
| | Cancel | | Cancels any setting changes and resets the **Ethernet Settings** to the previous values |
| | Ethernet Status (read-only) | OK | Ethernet communications for the card are valid |
| | | Link Down | Ethernet communications for the card are invalid. The ethernet cable may be disconnected on the rear module or the ethernet network may be down or experiencing problems. |
| | | No IP Address | The following conditions are occurring:<br>• The **Method** is set to **DHCP**.<br>• The ethernet cable connected to card rear module is connected.<br>• A valid IP Address could not be obtained. The DHCP server may be down or is still powering up after a power outage. |
| | MAC Address (read-only) | ##:##:##:##:##:## | The MAC Address for the card |

# Router Tab

The **Router** tab provides additional configuration options for routers.

***Table 6.10 Router Tab Items***

| Menu Title | Item | | Parameter | Description |
|---|---|---|---|---|
| **Router Setup** | Password | | | Enter the password for the NK-IPS if this feature is enabled on your device |
| | Virtual | | Physical* | Router references the physical connections for its crosspoints |
| | | | Virtual | Router references the virtual connections for its crosspoints |
| | Address | | 1-254* | Specifies the T-Bus address of the NK Router |
| | Delay | | 0-15[a] | Specifies the length of time, in frames, that the MC1-MK will wait after sending a command to the router |
| | Router Level | L1 | Selected* | Specifies the router level(s) to include for every transition the MC1-MK executes between router sources |
| | | | Cleared | |
| | | L2-L32 | Selected | |
| | | | Cleared* | |

a. The default value is 3.

# Video Inputs Tab

The menu items available in the **Video Inputs** tab enable you to map the router sources to crosspoint buttons on the On Air interface. The tab is divided into three areas based on function: mapping router outputs to the MC1-MK input BNCs, mapping router inputs to the crosspoint rows, and mapping router inputs to the shifted crosspoint rows.

***Table 6.11 Video Inputs Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Router Output - Master Control Inputs** | Bkgd A (BNC 3)<br>Bkgd B (BNC 1)<br>Key Vid (BNC 2)<br>Key Alpha (BNC 4) | 0*-#[a] | • Specifies the router output source connected to the specified MC1-MK input BNC<br>• A value of 0 means the MC1-MK will not attempt any router switches.<br>• Positive values (1-65535) are interpreted as router inputs (either physical or virtual depending on the settings specified in the **Router** tab) |
| **Crosspoints Button # / SHIFTED Crosspoints Button #** | Type[b] | Black | Assigns Black as the source for the crosspoint button |
| | | Router | Crosspoint source as specified by the Router Input field |
| | | RTR Extra #[c] | Crosspoint source as specified by the Router Input field. However, the router input is automatically updated whenever the Automation requests a crosspoint that is not already mapped. |
| | | Logo # | Assigns the specified logo channel as the source for the crosspoint button |
| | | Logo Alpha # | Assigns the specified logo alpha channel as the source for the crosspoint button |
| | Router Input[d] | # | Assigns the router input source to the crosspoint button. Only applies when **Type** is set to **Router** or **RTR Extra**. |
| | Alpha Input[d] | # | Assigns the router source that MC1-MK takes on the alpha input when an external Auto Select Key is selected. Only applicable when **Type** is set to **Router** or **RTR Extra**. |
| | Name | | Use this field to enter a new label for the crosspoint |

a. The default value is 0.
b. Refer to **Table 3.1** on page 3-7 for information on the default crosspoint mapping.
c. A maximum of two crosspoint buttons can be assigned to RTR Extra.
d. If the Type is not set to Router, the Router Input, and Alpha Input fields are ignored. However, the Name field is updated with the default value of the source selected in the Type menu (e.g. If you selected Logo 1 in the Type field, the Name field will display Logo 1).

# Personality Tab

**Table 6.12** lists the available options in the **Personality** tab.

***Table 6.12 Personality Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Timing Display** | Timing Display | Relative to Reference* | The **BKGD Timing**, **Key Video Timing**, and the **Key Alpha Timing** fields in the **Signal** tab displays the timing values relative to the reference:<br>• A negative offset value indicates that the SDI signal is earlier than the analog reference.<br>• A positive value indicates that the SDI signal is later than the analog reference. |
| | | Input to Output | The **BKGD Timing**, **Key Video Timing**, and the **Key Alpha Timing** fields in the **Signal** tab displays the timing values relative to the output:<br>• A negative offset value indicates that the SDI BKGD input signal is earlier than the SDI OUT signal.<br>• A positive value indicates that the SDI BKGD input signal is later than the SDI OUT signal. |
| **Card Lock** | Edit Permission | Unlocked* | All menu items are unlocked and can be edited |
| | | Locked | All menu items, except this one, are locked and read-only. The card can still be controlled by GPI and/or external device commands if these features were enabled prior to locking. |
| **Enable Fan Alarm** | Stalled Fan | Selected* | The **FPGA Fan** field in the **Hardware** tab reports when the fan on the card surface is not operating correctly |
| | | Cleared | Disables this feature |
| **Post Transition Behavior** | Toggle Program/ Preset Bus | Selected* | After a transition, the Preset bus switches to the former Program bus selections |
| | | Cleared | The Preset bus will not change after a transition. The user must manually select the next Preset source. |
| | Disarm Preset Keyers[a] | Selected* | After a transition, the keyers on the Preset bus will be turned off automatically. The user must manually select keyers to be included in the next transition. |
| | | Cleared | Keyers will toggle between Program and Preset after a transition |
| | Reset Audio Gain | Selected* | Audio gain will be set back to 0dB during a transition |
| | | Cleared | Disables this feature |

***Table 6.12 Personality Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Channel Select Buttons** | Channel Select Buttons | 1-10[b] | Specifies the number of Channel Select buttons to display in the On Air Control interface for the MC1-MK. |

a. The Disarm Preset Keyers option affects all Keyers unless EAS is enabled (on the Remote Control tab) in which case only Keyers 1-3 are affected.
b. The default is 2.

# Load/Save Tab

The menu items available in the **Load/Save** tab enable you to reset menu parameters for the card to the factory default values.

***Table 6.13 Load/Save Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **Global Settings** | Load Factory Defaults | | Resets all DashBoard parameters and values (excluding ethernet, reference, and output format settings) to the factory default values |

# TFT EAS Setup Tab

The **TFT EAS Setup** tab enables you to customize the EAS text overlay received by your TFT EAS 911 that is automatically assigned to Logo channel 4 in Key 4.

***Table 6.14 TFT EAS Setup Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| | Preview | Off* | Disables the setup mode; removes test message from the PST output |
| | | EAN | Refer to the FCC's EAS regulations at 47 C.F.R. Part 11 for more information on message categories. |
| | | Warnings | |
| | | Watches | |
| | | Emergencies | |
| | | Statements | |
| **EAS Settings** | Top Row | 0-# | Adjusts the vertical position of the EAS text overlay; the range depends on the video format.<br>Applies only to Warnings, Watches, and Statements categories. |
| | Text Size | 1-10 | Specifies the text size where 1 is smallest and 10 is largest. The actual text size depends on the video format. The default is 5. |
| | Text Color | White* | Specifies the foreground color of the text |
| | | Red | |
| | | Green | |
| | | Blue | |
| | | Amber | |
| | | Yellow | |
| | | Cyan | |
| | | Black | |
| | Background Color | White | Specifies the background color behind the text. Each message category has a unique default value as follows:<br>• Red — Emergency Alert and All Warnings<br>• Blue — All Watches<br>• Amber — All Emergencies<br>• Transparent — All Statements |
| | | Red | |
| | | Green | |
| | | Blue | |
| | | Amber | |
| | | Yellow | |
| | | Cyan | |
| | | Black | |
| | | Transparent | |
| | Drop Shadow | Selected* | Applies a visual effect that makes the text appear three-dimensional |
| | | Cleared | Disables this feature |

*Table 6.14 TFT EAS Setup Tab Items*

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **EAS Settings** | Pan Speed | -5 to -1 | Determines how fast the EAS message scrolls across the screen (from left to right) where: -5 is the fastest speed and -1 is the slowest.<br>The default value is dependent on the video format as follows: -1 for SD video formats, -2 for HD video formats. |
| | EAS Text Attributes | OK (Green) | Text color and background color do not match; text can be read on-screen |
| | | EAN not visible (Yellow) | Text color and Background color match for EAN messages; text cannot be read on-screen |
| | | Warnings not visible (Yellow) | Text color and Background color match for Warnings; text cannot be read on-screen |
| | | Watches not visible (Yellow) | Text color and Background color match for Watches; text cannot be read on-screen |
| | | Emergencies not visible (Yellow) | Text color and Background color match for Emergencies; text cannot be read on-screen |
| | | Statements not visible (Yellow) | Text color and Background color match for Statements; text cannot be read on-screen |

# Sage EAS Setup

The **Sage EAS Setup** tab enables you to customize the EAS text overlay received by your SAGE EAS that is automatically assigned to Logo channel 4 in Key 4.

***Table 6.15 Sage EAS Setup Tab Items***

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| | Preview | Off* | Disables the setup mode; removes test message from the PST output |
| | | Low Priority | Refer to the FCC's EAS regulations at 47 C.F.R. Part 11 for more information on message categories. |
| | | Medium Priority | |
| | | High Priority | |
| **SAGE Generic Character Generator Settings** | Top Row | 0-# | Adjusts the vertical position of the EAS text overlay; the range depends on the video format.<br>Applies only to All Warnings, All Watches, and All Statements categories. |
| | Text Size | 1-10 | Specifies the text size where 1 is smallest and 10 is largest. The actual text size depends on the video format. The default is 5. |
| | Text Color | White* | Specifies the foreground color of the text |
| | | Red | |
| | | Green | |
| | | Blue | |
| | | Amber | |
| | | Yellow | |
| | | Cyan | |
| | | Black | |
| | Background Color | White | Specifies the background color behind the text. Each message category has a unique default value as follows:<br>• Red — High Priority<br>• Yellow — Medium Priority<br>• Green — Low Priority |
| | | Red | |
| | | Green | |
| | | Blue | |
| | | Amber | |
| | | Yellow | |
| | | Magenta | |
| | | Cyan | |
| | | Black | |
| | Drop Shadow | Selected* | Applies a visual effect that makes the text appear three-dimensional |
| | | Cleared | Disables this feature |

*Table 6.15 Sage EAS Setup Tab Items*

| Menu Title | Item | Parameter | Description |
|---|---|---|---|
| **SAGE Generic Character Generator Settings** | Pan Speed | -5 to -1 | Determines how fast the EAS message scrolls across the screen (from left to right) where: -5 is the fastest speed and -1 is the slowest.<br>The default value is dependent on the video format as follows: -1 for SD video formats, -2 for HD video formats. |
| | EAS Text Attributes | OK (Green) | Text color and background color do not match; text can be read on-screen |
| | | Low Priority not visible (Yellow) | Text color and Background color match for Low Priority messages; text cannot be read on-screen |
| | | Medium Priority not visible (Yellow) | Text color and Background color match for Medium Priority messages; text cannot be read on-screen |
| | | High Priority not visible (Yellow) | Text color and Background color match for High Priority messages; text cannot be read on-screen |

# Appendix B. Specifications

## In This Appendix

This appendix provides information on the specifications for your MC1-MK. Note that specifications are subject to change without notice.

The following topics are discussed:

- Technical Specifications
- Communication Specifications
- Video Characteristics

# Technical Specifications

This section includes the technical specifications for the MC1-MK.

***Table 7.1 MC1-MK Technical Specifications***

| Category | Parameter | Specification |
|---|---|---|
| **Serial Digital Video Inputs** | Number of Inputs | 4 |
| | SDI Data Rates and SMPTE Standards Accommodated | • SMPTE 259M (270Mbps)<br>• SMPTE 292M (1.485Gbps) |
| | Impedance | 75ohms |
| | Return Loss | SDI IN 1: 15dB to 1.5GHz<br>SDI IN 2-4: >15dB to 1.5GHz |
| | Equalization | 80m |
| **Serial Digital Video Outputs** | Number of Outputs | 4 |
| | Impedance | 75ohms |
| | Return Loss | SDI OUT 1: 15dB to 1.5GHz<br>SDI OUT 2-4: >15dB to 1.5GHz |
| | Signal Level | 800mV +/-10% |
| | DC Offset | 0+/-50mV |
| | Rise and Fall Time | SD: 900ps typical<br>HD: 150ps typical |
| | Overshoot | <10% typical |
| **Cable Lengths** | RS-232 Serial Interface Maximum Cable Length | 10m (33ft) |
| | RS-422 Serial Interface Maximum Cable Length | 300m (984ft) |
| **Environment** | Maximum ambient temperature | 40°C (104°F) |
| **Power Consumption** | Power Consumption | 22W |

# Communication Specifications

This section provides additional information on the different connector types of the MC1-MK rear module.

## Serial COM Port

When building cables to interface to the card **Serial COM** port, it is recommended to use CAT-5 or CAT-5e cable with the standard ethernet wiring color coding. **Table 7.2** shows the pin assignment of the **Serial COM** port located on the Rear Module.

**Caution** — *Pins 4 and 5 provide +12V.*

***Table 7.2 RJ-45 Pin Assignment***

| RJ45 Pin | RS-232 | RS-422 | RS-422 Null |
|---|---|---|---|
| 1 | n/c | Tx+ | Rx+ |
| 2 | Rx | Tx- | Rx- |
| 3 | Tx | Rx+ | Tx+ |
| 4 | +12V | +12V | +12V |
| 5 | +12V | +12V | +12V |
| 6 | n/c | Rx- | Tx- |
| 7 | GND | GND | GND |
| 8 | GND | GND | GND |

## LTC Serial Cabling Requirements

When building cables to interface to the card **Serial COM** port and an LTC device, it is recommended to use CAT-5 or CAT-5e cable with the standard ethernet wiring color coding.**Table 7.3** shows the pin assignment of the **Serial COM** port.

***Table 7.3 Interface Cable for LTC Input***

| RJ45 Pin | RS-422 Serial COM Rx Port | LTC Signal |
|---|---|---|
| 1 | Tx+ | |
| 2 | Tx- | |
| 3 | Rx+ | LTC+ |
| 4 | +12V | |
| 5 | +12V | |
| 6 | Rx- | LTC- |
| 7 | GND | GND |
| 8 | GND | GND |

## Ethernet 100/10 Port

The **Ethernet 100/10** port on the Rear Module is used to connect to an ethernet network for communications, software upgrades using DashBoard, media file management via an FTP client, and for viewing thumbnails

**Note** — *Contact your IT Department before connecting the card to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP Address, Subnet Mask, and Gateway for the card.*

## GPIO Connections

When configured as a GPI, a port behaves as an input, and can be used to trigger actions such as Cut/Dissolve the Key and/or Background. A push-button switch, or an ON-OFF switch, may be directly connected between the port and the adjacent ground pin. Alternatively, an external device may drive a low level. Minimum pulse duration is 1ms, anything shorter will be filtered out. Typically, users will configure the GPI for Edge trigger. This means that the action is carried out either on the falling edge (button is pushed), or rising edge (button is released), depending on which Polarity is selected. Alternatively, users may configure the GPI for Level trigger. In this mode, the action is carried out on both the rising and falling edges, so there are effectively two states. The Polarity control can be used to invert the behavior. Regardless of the trigger type, GPI commands may be overridden by other command inputs such as serial protocols.

The **Edge** option enables the GPI to act as a latching trigger. Edge triggers are used when you want to toggle between settings. This option enables the GPI to execute a specific function.

- If configured for Falling Edge, the selected function is executed when the GPI input signal transitions from High to Low.
- If configured for Rising Edge, the selected function is executed when the GPI input signal transitions from Low to High.
- Edge triggered GPI signals are sampled once per frame and the associated function is executed only once per frame. The minimum pulse width is 1 millisecond.
- Typically, the edge triggered GPI is driven by external equipment that generates one pulse per event.

**Level** triggers are used when you want to assert a particular state for a setting. You define the on-air state of the function as being either Level High or Level Low. Therefore, if the on-air state of the Key is defined as Level High for example, when the GPI is a Level High signal, the Key will stay on air. If a Level Low is received, the Key will be taken off air.

- If configured for Active Low, the selected function is executed when the GPI input signal is driven Low.
- If configured for Active High, the selected function is executed when the GPI input signal is driven High.

## Tally Connections

When configured as a Tally, a port becomes an output, providing a status indicator. Typically this is used to indicate which input(s) are on-air at any given moment. Each tally output on the card can be configured to be active when any of the four inputs are on air. They can be configured as Active High or Active Low. The Trigger type (Edge or Level) is only relevant for GPI inputs and has no effect on Tally outputs. The tally outputs defaults to a logical high level when inactive. When the tally becomes active, for example the signal is on-air, then the output is driven low.

# Video Characteristics

This section provides additional information for configuring video sources.

## Video Processing

Keep the following in mind when configuring your video inputs and outputs:

- The SDI output timing is fixed on the MC1-MK and is set to approximately 0.5 lines after the reference.
- Each video input has a line sync that can support a full line of SD or HD video including horizontal blanking.
- All video inputs must be timed with the reference. The input tolerance is approximately +/- 0.5 line. Exceeding this tolerance will result in the output shifting of 1 line. The **Timing** status fields in the **Signal** tab displays a Yellow indicator when operating outside the range of the line sync. In such cases, a vertical shift of 1 line or more may occur.
- All of the video inputs must be the same video format as specified in the **Video** tab for the card. If the formats do not match, the card reports an error in the DashBoard **Signal Status** area and on the card-edge LEDs.
- The Program and Preset sources can be any of the four internally generated Logo channels or external inputs, or an internally generated black.
- Each of the four outputs can be configured as Program, Preset, or one of four Clean Feeds.
- All of the outputs can be enabled to add dither, clip to SMPTE black or allow super-black, or clip to SMPTE white or allow super-white.

## Output Format Reference Compatibility

Depending on the reference format you use, the card will only be able to operate in certain formats as outlined in **Table 7.4**.

***Table 7.4 Output/Reference Compatibility***

| Reference | Output | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 480i 59.94Hz | 720p 59.94Hz | 1080i 59.94Hz | 576i 59.94Hz | 720p 50Hz | 1080i 50Hz | 1080pSF 23.98Hz | 1080pSF 24Hz |
| 480i 59.94Hz | ✓ | ✓ | ✓ | | | | | |
| 720p 59.94Hz | | ✓ | | | | | | |
| 1080i 59.94Hz | ✓ | ✓ | ✓ | | | | | |
| 576i 59.94Hz | | | | ✓ | ✓ | ✓ | | |
| 720p 50Hz | | | | | ✓ | | | |
| 1080i 50Hz | | | | ✓ | ✓ | ✓ | | |
| 1080pSF 23.98Hz | | | | | | | ✓ | |
| 1080pSF 24Hz | | | | | | | | ✓ |

# Appendix C. Serial Protocols

## In This Appendix

This appendix provides additional information on the serial communications protocols used with the MC1-MK.

The following topics are discussed:

- Miranda Presmaster Control System Commands

# Miranda Presmaster Control System Commands

The MC1-MK supports a subset of Miranda Presmaster Control System automation commands.

***Table 8.1 Supported Miranda Presmaster Control System Commands***

| Command | Code | Supported | Notes |
|---|---|---|---|
| **Simple Commands** | | | |
| SET_TRANS_TYPE | 0x01 | ✓ | Only V-Fade, Fade-Take, Mix, Take-Fade, Cut transition types |
| ENQ_STAT | 0x02 | | |
| SET_TRANS_RATE | 0x03 | | |
| SET_DSK1_STATE | 0x06 | | |
| SET_DSK2_STATE | 0x07 | | |
| SET_PRG_VID_SRC | 0x09 | ✓ | |
| SET_PRG_AUD_SRC | 0x0A | | Audio follows video |
| SET_PRESET_VID_SRC | 0x0B | ✓ | |
| SET_PRESET_AUD_SRC | 0x0C | | Audio follows video |
| SET_AUX_VID_SRC | 0x0D | | |
| SET_AUX_AUD_SRC | 0x0E | | Audio follows video |
| TAKE_ALL | 0x0F | ✓ | |
| TAKE_AUDIO | 0x10 | | |
| AO_STATE | 0x13 | | |
| AO_SRC | 0x14 | | |
| SRC_TABLE_SET | 0x1A | | |
| MIXER_POLL | 0x1E | ✓ | Always returns 0xFF 0x1E |
| AO_LEVEL | 0x24 | | |
| PRG_LEVEL | 0x25 | | |
| SRC_CHN_LEVEL | 0x26 | | |
| DSK_CLIP_LEVEL | 0x27 | | |
| DSK_GAIN_LEVEL | 0x28 | | |
| SRC_GAIN | 0x29 | | |
| SET_AUTO_STATE | 0x2B | | |
| START_AUDIO_LEAD | 0x2C | | Audio leading fixed at 1 frame |
| ABORT_AUDIO_LEAD | 0x2E | | |
| START_AUDIO_LAG | 0x2F | | |
| ABORT_AUDIO_LAG | 0x31 | | |
| DSK1_SETTING | 0x32 | | |
| DSK2_SETTING | 0x33 | | |
| SET_AUDIO_MODE | 0x34 | | |
| SET_AO_RATE | 0x38 | | |

*Table 8.1 Supported Miranda Presmaster Control System Commands*

| Command | Code | Supported | Notes |
|---|---|---|---|
| SET_U_FADE_TIMES | 0x3C | | |
| **Extended Commands** | | | |
| IS2_TUNNEL | 0x0001 | | |
| TAKE_VIDEO | 0x0010 | | Video and audio are switched together. |
| DSK_ARM | 0x0006 | ✓ | |
| DSK_STATE | 0x0007 | | |
| LOAD_PREV_IMG | 0x0032 | | |
| LOAD_IMG | 0x0033 | | |
| VO_ARM | 0x0013 | ✓ | Audio over is not implemented, but this command responds as though it were |
| VO_STATE | 0x0014 | | |
| VO_PRESET | 0x0024 | | |
| VO_DUCK | 0x0025 | | |
| ENQ_DSK_IMG | 0x0034 | | |
| VO_RATE | 0x0038 | | |
| VO_SHUFFLE | 0x0026 | | |
| VGPI_ARM | 0x0130 | | |
| VGPI_STATE | 0x0140 | | |
| SET_PCS_CHN | 0x0040 | | |
| GET_PCS_CHN | 0x0041 | | |
| AUTO_TALLY_ENA | 0x0042 | | |
| SET_PAN_SHOTBOX | 0x0043 | | |
| GET_PAN_SHOTBOX | 0x0044 | | |
| CHECK_MEDIA | 0x0047 | | |
| DISCONN_PAN | 0x0048 | | |

# Appendix D. Service Information

## In This Appendix

This appendix contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

# Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your MC1-MK, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the "**Contact Us**" section.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check —** Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Reference Signal Status** — Verify that the analog reference (blackburst or tri-level) is supplied on one of the three reference inputs. Check the Reference Input and the Output Format settings. Also check the status of the reference by navigating to the Reference Status field located on the Signal tab in DashBoard.
4. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
5. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
6. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

## Software Upgrades

If you encounter problems when upgrading your card software, verify the following:

- Your network settings on the card are valid. Refer to **Table 6.9** on page 6-13 for a list of settings.
- Ethernet communication is properly configured.
- The file you are attempting to load is a ***.bin** file that is for the card you are upgrading.

# Warranty and Repair Policy

The MC1-MK is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your MC1-MK proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this MC1-MK has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Ross Video policy dictates that all repairs to the MC1-MK are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

## In Case of Problems

Should any problem arise with your MC1-MK, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your MC1-MK. If required, a temporary replacement frame will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

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***Notes:***

***Notes:***

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| **Technical Support** | Telephone: | +1 613 • 652 • 4886 |
| | After Hours Emergency: | +1 613 • 349 • 0006 |
| | Email: | techsupport@rossvideo.com |
| **General Information** | Telephone: | +1 613 • 652 • 4886 |
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